MATEMATIKA

2020

DAVLAT TEST MARKAZI

TEST TOPSHIRIQLARI TO‘PLAMI

DTM

KIRISH

To‘plamdan O‘zbekiston Respublikasi oliy ta’lim muassasalari bakalavriatiga 2020–2021-o‘quv yili uchun kirish test sinovlarida foydalanilgan test topshiriqlari o‘rin olgan. Test topshiriqlari mazkur fan bo‘yicha umumiy o‘rta maktab hamda akademik litsey va kasb-hunar kollejlari o‘quv dasturlarida keltirilgan mavzular doirasida shakllantirilgan. To‘plam o‘qituvchilar, oliy ta’lim muassasalariga kirish uchun tayyorgarlik ko‘rayotgan abituriyentlar va keng jamoatchilik uchun mo‘ljallangan.

O‘zbekiston Respublikasi ta’lim muassasalariga o‘qishga qabul qilish bo‘yicha Davlat komissiyasining 10-son bayoni bilan 2021–2022-o‘quv yili uchun respublika oliy ta’lim muassasalarining bakalavriat ta’lim yo‘nalishlariga mos test sinovi topshiriladigan fanlar majmuasi, test topshiriqlari soni hamda baholash mezonlari tasdiqlandi.

Natural sonlar. Natural sonlar ustida amallar

1. Agar $\overline{5537n2}$ olti xonali son 18 ga qoldiqsiz bo'linsa, n nitoping.

A) *1* B) *5*
C) *7* D) *3*

2. $25^{15} + 16^{27} + 372$ yig'indi qanday raqam bilan tugaydi?

A) *8* B) *5*
C) *3* D) *6*

3. a va b raqamlarning yig'indisi 7 ga qoldiqsiz bo'linadi. Agar $\overline{aba} + 1$ ko'rinishidagi uch xonali sonlarni 7 ga bo'lganda bir xil qoldiq qolsa, shu qoldiqni toping.

A) *3*
B) *5*
C) *1*
D) *6*

4. Agar a va b natural sonlarning yig'indisi 6 ga qoldiqsiz bo'linsa, $37a + 19b$ ni 6 ga bo'lgandagi qoldiqni toping.

A) *5*
B) *2*
C) *1*
D) *0*

5. Agar n, m va k natural sonlar uchun $nm = 25$ va $mk = 4$ bo'lsa, $n + 2m + k$ ifodaning qiymatini toping.

A) *32* B) *29*
C) *31* D) *30*

6. Agar $24 \cdot n$ ($n \in N$) ifoda biror natural sonning kvadratiga teng bo'lsa, $n + 14$ ning eng kichik qiymatini toping.

A) *19*
B) *21*
C) *20*
D) *18*

7. $(65464 + 83569) \cdot 72647$ ni 5 ga bo'lgandagi qoldiqni toping.

A) *1*
B) *4*
C) *3*
D) *2*

8. $48 \cdot 42 \cdot 34 \cdot 56 - 23 \cdot 39 \cdot 61$ ayirma qanday raqam bilan tugaydi?

A) *4*
B) *7*
C) *6*
D) *3*

9. Ikkita natural sonning yig'indisi 15 ga teng bo'lsa, ularning ko'paytmasi quyidagi sonlardan qaysi biriga teng bo'lishi mumkin?

A) *53* B) *52*
C) *55* D) *54*

10. Quyidagi tasdiqlardan qaysi biri natural sonlar uchun har doim to'g'ri?

A) *ikkita tub sonlar ko'paytmasi toq son bo'ladi*
B) *har qanday tub sonning kvadrati faqat uchta natural bo'luvchiga ega bo'ladi*
C) *barcha tub sonlar toq sonlardir*
D) *ikkita tub sonlar yig'indisi juft son bo'ladi*

11. $11^5 - 11$ ayirma quyidagi sonlardan qaysi biriga qoldiqsiz bo'linadi?

A) *17* B) *10*
C) *7* D) *13*

12. a ning o'rniga quyidagi sonlardan qaysi birini qo'yganda a; $a + 6$ va $a + 14$ sonlar tub sonlar bo'ladi?

A) *29* B) *13*
C) *19* D) *23*

13. Ikkita natural sonning EKUKi 168 ga teng va ularning nisbati 3:4 kabi bo'lsa, katta sonni toping.

A) *48* B) *42*
C) *56* D) *52*

14. $5p - 5$ natural soni 1; 3; 5 va 15 sonlarga qoldiqsiz bo'linadi. p ning eng kichik natural qiymatini toping.

A) *2*
B) *5*
C) *7*
D) *4*

15. 9; 10; 11 va 12 sonlardan jami nechta o'zaro tub sonlar juftligini tuzish mumkin?

A) *3*
B) *4*
C) *2*
D) *5*

16. Quyidagi tengliklardan nechtasi qoldiqli bo'lishni ifodalaydi?

a) $43 = 5 \cdot 8 + 3$;
b) $43 = 5 \cdot 7 + 8$;
c) $43 = 6 \cdot 7 + 1$;
d) $43 = 5 \cdot 9 - 2$

A) *2* B) *4*
C) *1* D) *3*

17. 18 va 27 sonlarining EKUBini toping.
A) *10*
B) *54*
C) *9*
D) *50*

18. $a = 12$ va $b = 18$ bo'lsa, EKUB(a; b)·EKUK(a; b) ni hisoblang.
A) *216*
B) *215*
C) *213*
D) *214*

19. $a = 18$ va $b = 27$ bo'lsa, EKUB(a; b)·EKUK(a; b) ni hisoblang.
A) *489*
B) *488*
C) *487*
D) *486*

20. 17017 son quyidagi sonlardan qaysi biriga qoldiqsiz bo'linadi?
A) *49*
B) *51*
C) *34*
D) *91*

21. 51051 son quyidagi sonlardan qaysi biriga qoldiqsiz bo'linmaydi?
A) *17*
B) *13*
C) *19*
D) *77*

22. Quyidagi sonlardan qaysi biri 24 ga qoldiqsiz bo'linadi?
A) *94824*
B) *68740*
C) *53542*
D) *12354*

23. 3 ta turli raqamlar ko'paytmasi ularning yig'indisiga teng. Bu raqamlardan eng kichigini toping.
A) *2*
B) *1*
C) *3*
D) *4*

Haqiqiy sonlar va ular ustida amallar

1. Hisoblang: $(-10)^3:(-10)^2 + (-9)^3:(-9) - (-2)^6:(-2)^5$

A) *-89* B) *69*
C) *73* D) *93*

2. $\left(6\frac{5}{12} - 3\frac{3}{4}\right) : 1\frac{7}{9}$ ni hisoblang.

A) $\frac{1}{12}$
B) $\frac{3}{2}$
C) *2*
D) $\frac{5}{6}$

3. Quyida berilgan sonlardan eng kattasini toping.

A) $\frac{13}{16}$
B) $\frac{77}{96}$
C) $\frac{41}{48}$
D) $\frac{19}{24}$

4. Hisoblang: $\frac{222}{333} + \frac{444}{666} + \frac{666}{999}$

A) *1* B) *1,6*
C) *2* D) *1,5*

5. Hisoblang: $1 - \cfrac{1}{1 - \cfrac{1}{1 - \frac{1}{6}}}$

A) *6,5* B) *5*
C) *5,6* D) *6*

6. Hisoblang:

$$\left(2019 - \frac{1}{2019}\right) : \left(1 - \frac{1}{2019}\right)$$

A) $2019\frac{1}{2019}$
B) *2019*
C) *2020*
D) *2018*

7. n natural sonning qanday qiymatida $2 + \cfrac{1}{n + \frac{2}{3}} = \frac{13}{5}$ tenglik o‘rinli bo‘ladi?

A) *3* B) *1*
C) *4* D) *2*

8. Hisoblang: $12{,}3^2 - 4{,}7^2$

A) *129,4*
B) *129,1*
C) *129,2*
D) *129,3*

9. Hisoblang: $11{,}2 \cdot 4{,}25 \cdot (13{,}36 - 3{,}36)$

A) *252*
B) *476*
C) *588*
D) *342*

10. Hisoblang: $14{,}7 \cdot 13 - 3 \cdot 14{,}7$

A) *274*
B) *254*
C) *147*
D) *148*

11. Hisoblang: $3\frac{1}{3} \cdot 4 \cdot \frac{1}{5} - 4{,}2 \cdot \frac{2}{3}$

A) $11\frac{3}{5}$
B) $11\frac{1}{5}$
C) $\frac{2}{15}$
D) $13\frac{1}{5}$

12. Hisoblang: $3\frac{1}{3} \cdot 4\frac{1}{5} + 0{,}2 \cdot \frac{2}{3}$

A) $11\frac{3}{5}$
B) $11\frac{1}{5}$
C) $11\frac{2}{15}$
D) $13\frac{1}{5}$

13. Hisoblang: $(37{,}3 + 21{,}7) \cdot 13$

A) *766* B) *769*
C) *767* D) *768*

14. Hisoblang: $(35{,}3 + 23{,}7) \cdot 14$

A) *825*
B) *827*
C) *824*
D) *826*

15. Hisoblang: $(18{,}8 - 12{,}8) \cdot 18$

A) *109*
B) *106*
C) *108*
D) *107*

16. 0,372 + 3,649 + 4,8463 yig'indining qiymatini yuzdan birlar xonasigacha yaxlitlang.

A) *8,84*
B) *8,87*
C) *7,87*
D) *7,84*

17. 12,37267 – 8,674 ayirmaning qiymatini mingdan birlar xonasigacha yaxlitlang.

A) *3,699*
B) *3,68*
C) *3,69*
D) *3,679*

18. $-1{,}25$ soniga qarama-qarshi bo'lgan sonning teskarisi 0,1 dan qanchaga katta?

A) *0,3* B) *0,4*
C) *1,15* D) *0,7*

19. Hisoblang: $-16{,}28 + 8{,}192 - 2{,}131 + 9{,}42$

A) *−0,668* B) *−0,799*
C) *−0,648* D) *−0,789*

20. $a = \frac{22}{23}$, $b = \frac{23}{24}$ va $c = \frac{24}{25}$ sonlarni taqqoslang.

A) $c < a < b$
B) $a < c < b$
C) $a < b < c$
D) $c < b < a$

21. $a = (10 - 0{,}2)^2$, $b = 10^2 - 0{,}2^2$, $c = 10^2 - 0{,}2$ sonlarni taqqoslang.

A) $a > b > c$
B) $c > b > a$
C) $b > c > a$
D) $a > c > b$

22. $a = (10 - 0{,}1)^2$, $b = 10^2 - 0{,}1^2$, $c = 10^2 - 0{,}1$ sonlarni taqqoslang.

A) $c > b > a$
B) $a > b > c$
C) $b > c > a$
D) $a > c > b$

23. Hisoblang:

$$1 + \left(1 - \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \cdot \left(1 - \frac{1}{5}\right) \cdot \left(1 - \frac{1}{6}\right)$$

A) $1\frac{1}{6}$
B) $1\frac{1}{4}$
C) $1\frac{1}{5}$
D) $1\frac{1}{3}$

24. $\frac{2}{10} \cdot \frac{2}{100} \cdot \frac{2}{1000} \cdot \ldots \cdot \frac{2}{1\underbrace{00\ldots0}_{10\,ta}} : 256$ sonni standart shaklga keltiring.

A) $4 \cdot 10^{-54}$
B) $4 \cdot 10^{-45}$
C) $4 \cdot 10^{-44}$
D) $4 \cdot 10^{-55}$

25. Hisoblang: $\frac{4,(8) + 4,(6) + 4,(4)}{4,(5) + 4,(3) + 4,(1)}$

A) $1\frac{1}{13}$
B) $1\frac{1}{16}$
C) $1\frac{1}{14}$
D) $1\frac{1}{15}$

26. Hisoblang: $\dfrac{16-0{,}09^2}{2{,}3\cdot 5{,}18-3{,}48\cdot 2{,}3}$

A) *4,09* B) *2,3*
C) *1,7* D) *3,91*

27. $\dfrac{2}{4}+\dfrac{23}{44}+\dfrac{223}{444}+\dfrac{2223}{4444}$ ifodaning qiymati quyidagilardan qaysi oraliqda yotadi?

A) *(1; 2)*
B) *(3; 4)*
C) *(0; 1)*
D) *(2; 3)*

28. a va b natural sonlar uchun $a+\dfrac{b}{4}=10$ bo'lsa, u holda ab ifodaning eng katta qiymatini toping.

A) *72* B) *100*
C) *96* D) *84*

29. $\dfrac{27}{13}+\dfrac{77}{19}-\dfrac{93}{23}$ ifodaning qiymati quyidagi oraliqlardan qaysi birida yotadi?

A) *(0; 1)*
B) *(2; 3)*
C) *(3; 4)*
D) *(1; 2)*

30. Agar n natural son uchun $\dfrac{n^2-n+2}{n+1}$ kasrning qiymati (1; 2) oralig'ida joylashgan bo'lsa, kasrning shu oraliqdagi qiymatini toping.

A) $\dfrac{8}{5}$
B) $\dfrac{7}{6}$
C) $\dfrac{4}{3}$
D) $\dfrac{5}{4}$

31. a va b natural sonlar uchun $\dfrac{a}{5}=\dfrac{9}{b+3}$ bo'lsa, u holda $a+b$ ifodaning eng katta qiymatini toping.

A) *45* B) *15*
C) *43* D) *11*

32. Hisoblang: $\dfrac{22^3+18^3}{7^2-3^2}22\cdot 18$

A) *16*
B) *6*
C) *4*
D) *36*

33. $\frac{4}{33}$ sonni cheksiz davriy o'nli kasr ko'rinishida ifodalab, verguldan keyingi 20-o'rinda turgan raqamini toping.

A) *3* B) *1*
C) *4* D) *2*

34. $a=\frac{2^{10}+1}{2^{11}+1}$ va $b=\frac{2^{11}+1}{2^{12}+1}$ sonlar uchun quyidagi munosabatlardan qaysi biri to'g'ri?

A) $a < b$
B) $a > b + 1$
C) $a = b$
D) $a > b$

35. $\frac{27}{38}+\frac{49}{57}+\frac{19}{43}=a$ bo'lsa, $\frac{65}{38}-\frac{8}{57}+\frac{62}{43}$ quyidagilardan qaysi biriga teng?

A) $3 - a$ B) $3 + a$
C) $1 - a$ D) $1 + a$

36. Hisoblang: 1:2:3:4 + 1:2:3

A) $\frac{6}{5}$
B) $\frac{13}{6}$
C) $\frac{5}{24}$
D) $\frac{5}{6}$

37. a va b ratsional sonlar. Agar $a-\sqrt{5}\cdot b=5$ tenglik o'rinli bo'lsa, a^2+b^2 ni toping.

A) *37* B) *25*
C) *105* D) $36\frac{1}{5}$

38. $\frac{n^2-n+4}{n-2}$ ifodaning qiymati butun son bo'ladigan n ($n \in N$) ning barcha qiymatlari yig'indisini toping.

A) *20* B) *21*
C) *12* D) *16*

39. $\frac{n^2-n+2}{n+2}$ ifodaning qiymati butun son bo'ladigan n ($n \in N$) ning nechta qiymati bor?

A) *4* B) *2*
C) *1* D) *3*

40. Agar n va m natural sonlar uchun $\frac{6n-4m}{n}=1$ tenglik bajarilsa, $\frac{1}{n}+\frac{2}{m}$ ifodaning eng katta qiymatini toping.

A) $\frac{6}{10}$ B) $\frac{7}{10}$
C) $\frac{9}{10}$ D) $\frac{13}{20}$

41. Hisoblang: $7{,}16\cdot(8{,}21-6{,}18)+$
$+12{,}84\cdot(7{,}81-5{,}78)$

A) *42,8*
B) *40,6*
C) *21,4*
D) *20,3*

42. Hisoblang:

$$\frac{\left(2{,}5+1\frac{1}{2}\right)\cdot 2{,}5+\left(\left(6-\frac{6}{5}\right):6+\frac{1}{5}\right)}{0{,}5\cdot\left(4+\frac{4}{10}\right):4}$$

A) *19*
B) *15*
C) *20*
D) *25*

43. $\dfrac{\left(2{,}3+5:\dfrac{25}{4}\right)\cdot 20}{0{,}8\cdot 0{,}125+30{,}9}$ ni hisoblang.

A) *1*
B) *−2*
C) *3*
D) *2*

44. $\dfrac{\left(\dfrac{29}{27}-\dfrac{1}{9}\cdot\dfrac{4}{3}\right)\cdot 0{,}6}{\left(\dfrac{43}{18}-\dfrac{19}{36}\right)\cdot\dfrac{1}{67}+\dfrac{35}{36}}$ ni hisoblang.

A) $\frac{4}{9}$
B) $\frac{7}{9}$
C) $\frac{2}{9}$
D) $\frac{5}{9}$

45. $\frac{3}{4}:\frac{5}{6}+2\frac{1}{2}\cdot\frac{2}{5}-1:1\frac{1}{9}$ ni hisoblang.

A) *2*
B) *−1*
C) *0*
D) *1*

46. $1\frac{5}{28}\cdot\left(7\frac{5}{7}:3\frac{3}{5}-\frac{1}{7}\right)+$
$+5\frac{5}{6}:\frac{5}{12}-16\frac{5}{14}$ hisoblang.

A) *2*
B) *1*
C) *0*
D) *−1*

Matnli masalalar, foiz va proporsiya

1. 5 ta sonning o‘rta arifmetigi 14 ga teng. Bu sonlarga qaysi son qo‘shilsa, ularning o‘rta arifmetigi 15 ga teng bo‘ladi?
A) *22* B) *19*
C) *21* D) *20*

2. Oltita sonning yig‘indisi 60 ga teng. Ulardan birini 2 marta oshirib, qolganlari o‘zgartirilmagan holda yig‘indi qayta hisoblansa, 68 ga teng bo‘ladi. O‘zgartirilmagan beshta sonning yig‘indisini toping.
A) *54* B) *53*
C) *52* D) *56*

3. Yo‘lovchi 3 soatda 7,8 km yo‘l yurdi. Agar yo‘lovchi shu tezlik bilan yursa, 4,5 soatda necha km yo‘l yuradi?
A) *11,5* B) *11,7*
C) *11,6* D) *11,4*

4. Uzunligi 85 metr bo‘lgan (silindrik bir jinsli) sim uzunliklari 5:7:13 kabi nisbatda bo‘lindi. Hosil bo‘lgan simlardan eng yengilining uzunligini (m) toping.
A) *17,6* B) *17*
C) *17,4* D) *16*

5. Sutdan 10 foiz qaymoq olinadi. 32 kg sutdan necha kilogramm qaymoq olinadi?
A) *3,3* B) *3,1*
C) *3,2* D) *3,4*

6. 30 soni 40 ning qanday foizini tashkil qiladi?
A) *76*
B) *73*
C) *75*
D) *74*

7. Ishchi reja bo‘yicha 44 ta detal yasashi kerak edi. Lekin u rejadan 11 ta ortiq detal yasadi. Ishchi rejani necha foizga ko‘p bajargan?
A) *24*
B) *21*
C) *25*
D) *20*

8. Bog‘dagi 52 tup daraxtning 39 tasi mevali daraxt. Mevali daraxtlar bog‘dagi daraxtlarning necha foizini tashkil qiladi?
A) *65*
B) *75*
C) *70*
D) *80*

9. Bug'doydan 80 foiz un olinadi. 36 kg un olish uchun qancha (kg) bug'doy tegirmondan o'tkaziladi?

A) *45* B) *43*
C) *46* D) *44*

10. Bug'doyning 20 %i kepakka (chiqindiga) qolgani unga aylansa, 320 kg bug'doydan necha kilogramm un olinadi?

A) *256*
B) *254*
C) *258*
D) *257*

11. Ip 13 ta bo'lakka bo'lingan. Har bir bo'lak 15 dm dan bo'lsa, ipning dastlabki uzunligini (dm) toping.

A) *195*
B) *194*
C) *196*
D) *193*

12. Ip 12 ta bo'lakka bo'lingan. Har bir bo'lak 12 dm dan bo'lsa, ipning dastlabki uzunligini (dm) toping.

A) *146*
B) *144*
C) *143*
D) *142*

13. Agar $a-2$; $b+3$; 2 va 7 sonlar proporsiyaning ketma-ket hadlari bo'lsa, $\frac{b}{6}-\frac{7a}{12}$ ning qiymatini toping.

A) $-2\frac{1}{3}$
B) $1\frac{2}{3}$
C) $-1\frac{2}{3}$
D) $2\frac{2}{3}$

14. 6,3; 4,4; –3,8; x va 7,6 sonlarning o'rta arifmetigi 3,3 ga teng. x ning qiymatini toping.

A) *1,8*
B) *2,3*
C) *2,6*
D) *2*

15. Uchta sonning o'rta arifmetigi 24, 3 ga teng. Agar ulardan birinchisi 34,8 ga, ikkinchisi 18,9 ga teng bo'lsa, uchinchi sonni toping.

A) *19,8*
B) *19,2*
C) *21,1*
D) *18,6*

16. Zokirning 25000 so'm, Azizning esa 17000 so'm puli bor. Zokir pulining necha foizini Azizga bersa, ularning pullari miqdori teng bo'ldi?

A) *14,5* B) *16*
C) *18,5* D) *18*

17. Agar charxpalak 5 minutda $23\frac{3}{4}$ marta aylansa, u 12 minutda necha marta aylanadi?

A) *57*
B) $54\frac{1}{2}$
C) *53*
D) *61*

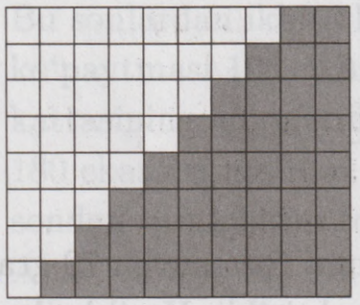
18. 117 soni 90 sonidan necha foizga ortiq?

A) *30*
B) *40*
C) *25*
D) *35*

19. 540 soni 25 %ga oshirildi. Hosil bo'lgan sonning 20 %ini toping.

A) *135*
B) *130*
C) *125*
D) *155*

20. Rasmda to'g'ri to'rtburchak teng bo'laklarga bo'lingan. To'g'ri to'rtburchakning necha foizi bo'yalgan?



A) *57,5*
B) *55*
C) *52,5*
D) *57*

21. 8; 19 va $3m$ sonlarning o'rta arifmetigi n dan 12 ga ortiq bo'lsa, m ni n orqali ifodalang.

A) $n + 3$
B) $n - 21$
C) $n - 3$
D) $\frac{n-3}{3}$

22. Hisoblang: $\left(\frac{1}{6}+\frac{1}{3}+\frac{1}{2}\right):\frac{1}{2}-1$

A) $\frac{3}{4}$
B) $\frac{3}{11}$
C) $\frac{11}{12}$
D) *1*

23. 16; 8 va $3m$ sonlarning o'rta arifmetigi n dan 14 ga ortiq bo'lsa, m ni n orqali ifodalang.

A) $n - 22$
B) $n + 11$
C) $n + 6$
D) $\frac{n-6}{3}$

24. 180 gramm toza suvga 70 gramm tuz aralashtirildi. Hosil bo'lgan aralashmaning necha foizi tuzdan iborat bo'ladi?

A) *22*
B) *30*
C) *25*
D) *28*

25. Sayohatga borish uchun sayohatchilardan pul yig'ish kerak. Agar har bir sayohatchi 75000 so'm dan bersa, harajatlar uchun 440000 so'm yetmaydi, agar har bir sayohatchi 80000 so'm dan bersa, 440000 so'm ortib qoladi. Sayohatga necha kishi bormoqchi?

A) *176*
B) *174*
C) *175*
D) *178*

26. Sayohatga borish uchun sayohatchilardan pul yig'ish kerak. Agar har bir sayohatchi 25000 so'm dan bersa, harajatlar uchun 140000 so'm yetmaydi, agar har bir sayohatchi 30000 so'm dan bersa, 140000 so'm ortib qoladi. Sayohatga necha kishi bormoqchi?

A) *58*
B) *56*
C) *60*
D) *54*

27. Dengiz suvida (og'irligi bo'yicha) 5 % tuz bor. 40 kg dengiz suvining tuzini 2 %li qilish uchun unga necha kilogramm chuchuk suv qo'shish kerak?

A) *70* B) *50*
C) *60* D) *40*

28. Ikki qopda 140 kg un bor. Agar birinchi qopdagi unning 12,5 %ni olib, ikkinchi qopga solinsa, ikkala qopdagi un miqdori (baravar) teng bo'ladi. Har qaysi qopda necha kilogramm un bor?

A) *75 va 65*
B) *90 va 50*
C) *85 va 55*
D) *80 va 60*

29. Birinchisida 5 %, ikkinchisida 40 % nikel bo'lgan ikki xil po'lat bor. Tarkibida 30 % nikel bo'lgan 140 tonna po'lat hosil qilish uchun birinchi xil po'latdan qancha olish kerak?

A) *45 t*
B) *40 t*
C) *50 t*
D) *30 t*

30. Ikki sonning o'rta proporsional miqdori shu sonlar kichigidan 12 ga ortiq, shu sonlarning o'rta arifmetik miqdori esa, bu sonlarning kattasidan 24 ga kichik. Shu sonlarning kichigini toping.

A) *10* B) *8*
C) *5* D) *6*

31. Uchta musbat sonning uchinchisi ikkinchisidan nechtaga ortiq bo'lsa, ikkinchisi ham birinchisidan shunchaga ortiq. Bu sonlardan ikkita kichigining ko'paytmasi 85, ikkita kattasining ko'paytmasi 115 ekanligi ma'lum. Shu uchta sondan birinchisini toping.

A) *8,5* B) *9*
C) *9,5* D) *8*

32. Uchta musbat sonning uchinchisi ikkinchisidan nechtaga ortiq bo'lsa, ikkinchisi ham birinchisidan shunchaga ortiq. Bu sonlardan ikkita kichigining ko'paytmasi 108, ikkita kattasining ko'paytmasi 180 ekanligi ma'lum. Shu uchta sondan birinchisini toping.

A) *9* B) *12*
C) *8* D) *10*

33. A sonining 30 %i B sonining 20 %idan 10 ga ko'p, B sonining 30 %i A sonining 20 %idan 35 ga ko'p bo'lsa, B sonini toping.

A) *350*
B) *300*
C) *250*
D) *200*

34. Birinchi sonning 5 %i va ikkinchi sonning 4 %i yig'indisi 44 ga, birinchi sonning 4 %i va ikkinchi sonning 5 %i yig'indisi 46 ga teng bo'lsa, bu sonlarni toping.

A) *300; 700*
B) *500; 500*
C) *400; 600*
D) *650; 350*

35. Birinchi sonning 5 %i va ikkinchi sonning 4 %i yig'indisi 44 ga, birinchi sonning 4 %i va ikkinchi sonning 5 %i yig'indisi 46 ga teng bo'lsa, bu sonlarning yig'indisini toping.

A) *1000*
B) *1100*
C) *800*
D) *900*

36. A sonining 30 %i B sonining 20 %idan 10 ga ko'p, B sonining 30 %i A sonining 20 %idan 35 ga ko'p bo'lsa, A va B sonlarni toping.

A) *200; 300*
B) *150; 400*
C) *200; 250*
D) *150; 300*

37. Jami 126 tonna olma, nok va olxo'ri mevalari olib kelindi. Olmaning og'irligi nokning og'irligiga qaraganda to'rt marta ko'p, olxo'ri esa nokka qaraganda 18 tonna kam. Necha tonna olma olib kelingan?

A) *48*
B) *96*
C) *24*
D) *84*

38. Qayiq oqimga qarshi 7 soatda suzib o'tadigan masofani, oqim bo'yicha 4 soatda suzib o'tdi. Agar qayiqning tezligi 30 km/s, oqim tezligi noma'lum x bo'lsa, quyidagilardan qaysi biri masala shartiga teng kuchli tenglama bo'ladi?

A) $\dfrac{7}{30+x} = \dfrac{4}{x-30}$
B) $4(30 + x) = 7(30 - x)$
C) $7(30 + x) = 4(x - 30)$
D) $\dfrac{30+x}{4} = \dfrac{30-x}{7}$

39. Ikkita quvur bir vaqtda ochilsa, hovuzni 5 soatda to'ldiradi. Agar suvning chiqishi birinchi quvurda 2 marta oshirilib, ikkinchisida 2 marta kamaytirilsa, hovuz 4 soatda to'ladi. Birinchi quvur hovuzni necha soatda to'ldiradi?

A) *16* B) *4*
C) *12* D) *10*

40. Hovuz ikkita quvur orqali 6 soatda to'ladi. Birinchi quvur ikkinchisiga qaraganda 5 soatga tezroq to'ldiradi. Hovuzni har bir quvur alohida qancha vaqt(soat)da to'ldiradi?

A) *30; 15* B) *11; 25*
C) *10; 15* D) *15; 20*

41. Mis, rux va qo'rg'oshindan iborat bo'lgan 20 kg li qotishmaning tarkibida 30 % mis bor. Rux va qo'rg'oshinning og'irliklari mos ravishda 5:2 nisbatda. Qotishmadagi ruxning og'irligi misning og'irligidan necha kilogrammga ortiq?

A) *6* B) *4,5*
C) *5* D) *4*

42. Bitta daftar 700 so'm bo'lib, u bitta qalamning narxidan 400 so'mga qimmat. O'quvchi 3300 so'mga bir nechta daftar va qalamlar sotib oldi. Quyida keltirilgan sonlardan qaysi biri xarid qilingan qalamlarning soni bo'la oladi?

A) *4*
B) *3*
C) *2*
D) *1*

43. a sonining 24 %i 40 ning $\frac{3}{5}$ qismiga teng. a ning $\frac{1}{4}$ qismi 15 sonidan qanchaga ortiq?

A) *25*
B) *10*
C) *15*
D) *20*

44. Shahar aholisi 2018-yili 6 %ga, 2019-yili 10 %ga ortdi. Shu ikki yilda shahar aholisi necha foizga ortgan?

A) *10,6*
B) *16*
C) *16,6*
D) *10*

45. Ma'lum bir ishni 24 ta ishchi 15 soatda bajara oladi. Shu ishning $\frac{1}{3}$ qismini bajarish uchun 10 ta ishchi necha soat ishlashi kerak?

A) *24*
B) *6*
C) *12*
D) *36*

46. Orasida 5 va 7 bo'lgan 10 ta sonning o'rta arifmetigi 18 ga teng. Agar bu sonlardan 5 va 7 sonlari chiqarib tashlansa, qolgan sonlarning o'rta arifmetigi nechaga teng bo'ladi?

A) *21*
B) *16*
C) *23*
D) *24*

47. Hovuzga ikkita jo'mrak ulangan. Bu jo'mraklardan birinchisi bo'sh hovuzni 8 soatda, ikkinchisi esa 24 soatda to'ldiradi. Agar birinchi jo'mrak ochilib, hovuzning yarmi to'lganda ikkinchi jo'mrak ham ochilsa, hovuz jami necha soatda to'ladi?

A) *7* B) *16*
C) *10* D) *8*

48. Tijoratchi donasi 700 so'mdan bo'lgan daftarlar sotib olib, ularning to'rtdan bir qismini 800 so'mdan, qolganini 1000 so'mdan sotdi va jami 110000 so'm foyda qildi. Tijoratchi nechta daftar sotgan?

A) *450*
B) *400*
C) *440*
D) *420*

49. Kater ma'lum masofani oqim bo'ylab 80 minutda, oqimga qarshi 240 minutda bosib o'tdi. Kater bu masofani turg'un suvda necha minutda bosib o'tadi?

A) *90*
B) *120*
C) *100*
D) *140*

50. Mahsulotning narxi ketma-ket ikki marta oshirilgach yangi narxi dastlabkisidan 124 foizga oshdi. Narx birinchi marta 60 foizga oshirilgan bo'lsa, ikkinchi marta necha foizga oshirilgan?

A) *30*
B) *64*
C) *32*
D) *40*

51. Bitta daftar 600 so'm va u bitta qalamning narxidan 400 so'mga qimmat. O'quvchi 3600 so'mga bir nechta daftar va qalamlar sotib oldi. Quyida keltirilgan sonlardan qaysi biri xarid qilingan qalamlarning soni bo'la oladi?

A) *3*
B) *5*
C) *1*
D) *4*

52. Yog'liligi 5 % bo'lgan 12 litr sut bilan yog'liligi 2 % bo'lgan necha litr sut aralashtirilsa, yog'liligi 4,4 % bo'lgan sut hosil bo'ladi?

A) *2,5*
B) *3*
C) *2*
D) *4,2*

53. Mis va ruxdan iborat qotishmaning massasi 18 kg. Qotishmaning 60 %ini rux tashkil qiladi. Qotishmaning 50 %ini mis tashkil qilishi uchun unga necha kilogramm mis qo'shish kerak?

A) *3,6*
B) *3,4*
C) *1,8*
D) *4,2*

Daraja, ildizlar

1. Kasrni qisqartiring: $\dfrac{10^{n+1}-10^n}{10^{n+1}+10^n}$

A) $\dfrac{9}{11}$ B) $\dfrac{10}{9}$
C) $\dfrac{9}{10}$ D) $\dfrac{11}{9}$

2. Kasrni qisqartiring: $\dfrac{10^{n+1}-2\cdot 10^n}{10^{n+1}+2\cdot 10^n}$

A) $\dfrac{11}{9}$
B) $\dfrac{9}{11}$
C) $\dfrac{3}{2}$
D) $\dfrac{2}{3}$

3. $29^{118} - 43\cdot 41\cdot 45\cdot 47$ ayirma qanday raqam bilan tugaydi?

A) *7*
B) *6*
C) *4*
D) *1*

4. Hisoblang: $64\cdot((4^{-1})^3 + (4^{-2})^3 - (4^{-3})^2) + 4$.

A) *4* B) *6*
C) *7* D) *5*

5. Hisoblang: $\dfrac{\sqrt{32}+\sqrt{50}-\sqrt{72}}{\sqrt{2}}$

A) $\sqrt{5}$
B) *2*
C) *1*
D) *3*

6. Hisoblang: $\dfrac{7\sqrt{5}-5\sqrt{7}}{\sqrt{35}}+\sqrt{5}$

A) $\sqrt{7}+\sqrt{5}$
B) $\sqrt{7}$
C) $\sqrt{5}$
D) $\sqrt{7}-\sqrt{5}$

7. Agar $a=5$ bo'lsa,
$\sqrt{a^2-6a+9}+\sqrt{a^2-12a+36}$
ifodaning qiymatini toping.

A) *4* B) *3*
C) *1* D) *5*

8. Hisoblang: $\dfrac{3}{\sqrt{12}-3}-\dfrac{3}{\sqrt{3}}-\sqrt{3}$

A) *–3* B) *2*
C) *3* D) *–2*

9. Hisoblang: $\sqrt{1-\dfrac{5}{9}}+\sqrt{1+\dfrac{7}{9}}$

A) $\dfrac{5}{3}$
B) *3*
C) $\dfrac{4}{3}$
D) *2*

10. Hisoblang: $\sqrt{6-2\sqrt{5}}-\sqrt{5}+2$

A) *1* B) *2*
C) *0* D) *3*

11. Hisoblang: $\sqrt{98\cdot 0{,}002\cdot 22{,}5}$

A) *2,1* B) *21,1*
C) *21* D) *20,1*

12. Ifodani soddalashtiring:
$\dfrac{1}{\sqrt{3}-\sqrt{2}}+\dfrac{1}{\sqrt{3}+\sqrt{2}}$

A) $2\sqrt{3}$
B) $\sqrt{2}$
C) $2\sqrt{2}$
D) $\sqrt{3}$

13. Hisoblang: $\dfrac{2^5}{2^4}\cdot 2$

A) *2* B) *4*
C) *8* D) *6*

14. Hisoblang: $\left(\dfrac{1}{13}\right)^8:\left(\dfrac{1}{13}\right)^7$

A) $\dfrac{1}{13}$
B) *0*
C) $\left(\dfrac{1}{13}\right)^{15}$
D) *13*

15. Hisoblang: $\dfrac{2^5\cdot 3^4}{2^4\cdot 3^3}$

A) *6* B) $\dfrac{2}{3}$
C) $\dfrac{3}{2}$ D) *1*

16. Hisoblang: $\frac{2\sqrt{2}}{3} - \frac{\sqrt{2}}{2}$

A) $\frac{\sqrt{2}}{6}$

B) $\frac{5\sqrt{2}}{6}$

C) $\frac{7\sqrt{2}}{6}$

D) *1*

17. Hisoblang: $\sqrt{10 \cdot 8 \cdot 45}$

A) *62*

B) *59*

C) *60*

D) *61*

18. $x = \sqrt[3]{4}$, $y = \sqrt{2}$ va $z = \sqrt[12]{105}$ sonlarni kamayish tartibida joylashtiring.

A) $x > y > z$

B) $y > z > x$

C) $y > x > z$

D) $x > z > y$

19. $0{,}009 \cdot 0{,}02 \cdot 10^6$ ko'paytmani standart shaklga keltiring.

A) $1,\ 8 \cdot 10^{-1}$

B) $1,\ 8 \cdot 10^{2}$

C) $1,\ 8 \cdot 10$

D) $1,\ 8 \cdot 10^{-2}$

20. Hisoblang: $\frac{512 \cdot \left(2^4\right)^3}{\left(2^7\right)^2 \cdot 128} \cdot \left(2^{-4}\right)^{-3} \cdot 4^{-5}$

A) *4*

B) $\frac{1}{2}$

C) *1*

D) *8*

21. $\left(\sqrt{4-\sqrt{15}} + \sqrt{4+\sqrt{15}}\right)^2$ ni hisoblang.

A) *4*

B) *10*

C) *12*

D) *8*

22. $\left(\sqrt[3]{27} + \sqrt[3]{8}\right)^{-1}$ ni hisoblang.

A) *0,2*

B) *0,1*

C) *0,4*

D) *0,5*

23. $(\sqrt[3]{343} - \sqrt[3]{8})^{-1}$ ni hisoblang.

A) *0,5*

B) *0,1*

C) *0,2*

D) *0,4*

24. $\sqrt[3]{6 + \sqrt{6 - \sqrt[4]{16}}}$ ni hisoblang.

A) *1*

B) *2*

C) *4*

D) *3*

25. $\sqrt{3-2\sqrt{2}}+\sqrt{5-2\sqrt{6}}+$
$+4-\sqrt[4]{(-3)^2}$ ni hisoblang.

A) *2*
B) *3*
C) *1*
D) *4*

26. Hisoblang:

$$\sqrt{28+10\sqrt{3}}-\frac{1}{\sqrt{7-4\sqrt{3}}}$$

A) *7*
B) *3*
C) $7-2\sqrt{3}$
D) $3-2\sqrt{3}$

27. Hisoblang:

$$\frac{\left(\sqrt{17}+\sqrt{2}\right)\cdot\left(\sqrt{34}+\sqrt{51}-\sqrt{6}-2\right)}{\sqrt{3}+\sqrt{2}}$$

A) *17*
B) *15*
C) *13*
D) *11*

28. Hisoblang:

$$\left(\frac{1}{2-\sqrt{3}}-\frac{1}{2+\sqrt{3}}\right)\cdot\left(\sqrt{12}-\sqrt{48}\right)$$

A) *-9*
B) *-12*
C) *-15*
D) *-18*

29. Hisoblang:

$$8\sqrt{4,5}-\frac{5\sqrt{10}}{2\sqrt{5}+\sqrt{10}}-7\sqrt{2}+16$$

A) *9*
B) *10*
C) *8*
D) *21*

30. Agar $a=6^{3x-2y}$ va $b=6^{3x+2y}$ bo'lsa, $5\cdot6x-3\cdot6y$ ni a va b orqali ifodalang.

A) $5\cdot\sqrt[4]{ab}-3\cdot\sqrt[6]{\frac{a}{b}}$
B) $5\cdot\sqrt[6]{ab}-3\cdot\sqrt[4]{\frac{b}{a}}$
C) $5\cdot\sqrt[4]{ab}-3\cdot\sqrt[3]{\frac{a}{b}}$
D) $5\cdot\sqrt[3]{ab}-3\cdot\sqrt{\frac{b}{a}}$

31. Agar $x=4$ bo'lsa,

$$\frac{x\sqrt{x}+27}{\sqrt{x}+3}-\frac{x^2+9x+81}{x+3\sqrt{x}+9}$$

ifodaning qiymatini toping.

A) *2*
B) *0*
C) *1*
D) *-1*

32. Agar $b > c > a > 0$ bo'lsa, $\sqrt{(b-c)^2 \cdot (a-c)^2 \cdot (b-a)^2}$ ifoda quyidagilardan qaysi biriga teng?

A) $(a-c)(b-c)(a-b)$
B) $(c-a)(b-a)(c-b)$
C) $(a-c)(b-c)(b-a)$
D) $(c-a)(a-b)(b-c)$

33. Ifodani soddalashtiring $(x > 0)$:

$$\sqrt[4]{\frac{9+4\sqrt{5}}{5x}} \cdot \left(5\sqrt{x} - \sqrt{20x}\right)^{0,5}$$

A) $\sqrt{5}$ B) *1*
C) *3* D) $\sqrt{3}$

34. Hisoblang:

$$10\sqrt[3]{108} - 7\sqrt[4]{256} + 18\sqrt[3]{32} - 12\sqrt[4]{162}$$

A) $-\sqrt[4]{2}$ B) *0*
C) $-2\sqrt[3]{4}$ D) $2\sqrt[3]{4}$

35. Hisoblang:

$$\left(9\sqrt{72} - 16\sqrt{50} + 8\sqrt{32}\right) : \left(4\sqrt{2}\right) - \left(-\frac{1}{4}\sqrt[4]{36}\right)^2$$

A) $\frac{1}{4}$
B) $-\frac{1}{4}$
C) $1\frac{1}{8}$ *1*
D) *1*

36. Soddalashtiring:

$$2\sqrt{\left(4-\sqrt{10}\right)^2} + \sqrt[4]{\left(4-2\sqrt{10}\right)^4}$$

A) $12-4\sqrt{10}$
B) *4*
C) *-2*
D) $-4\sqrt{10}$

37. Hisoblang: $\left(2^{(\sqrt{7}+3)}\right)^{\sqrt{16-6\sqrt{7}}} - 6\frac{1}{8}$

A) $1\frac{7}{8}$
B) $-2\frac{1}{8}$
C) *-6*
D) *2*

38. Hisoblang: $\left(\sqrt{7-4\sqrt{3}} - 1\right)^2 + 2\sqrt{3}$

A) $-2\sqrt{3}$ B) *4*
C) *2* D) *1*

39. Hisoblang: $\sqrt{2016 \cdot 2024 + 16}$

A) *2110*
B) *2010*
C) *2020*
D) *2210*

40. Hisoblang: $\sqrt{2019^2 \cdot 2015 \cdot 2023}$

A) *4* B) *14*
C) *16* D) *6*

41. Hisoblang:

$$\left(\frac{\sqrt{\sqrt{1012}+12\sqrt{7}}}{\sqrt{\sqrt{1016}-12\sqrt{7}}}+\frac{\sqrt{\sqrt{1012}-12\sqrt{7}}}{\sqrt{\sqrt{1012}+12\sqrt{7}}}\right)^2$$

A) *2024*
B) *2012*
C) *1012*
D) *1006*

42. $\dfrac{\sqrt{11}-4}{\sqrt{\sqrt{11}-3}+1}-\dfrac{\sqrt{11}-12}{\sqrt{\sqrt{11}-3}-3}$ ni hisoblang.

A) *2* B) *-4*
C) *-2* D) *4*

43. Hisoblang:

$$\left(\frac{1}{2-\sqrt{3}}-\frac{1}{2+\sqrt{3}}\right)\cdot(\sqrt{12}-\sqrt{75})$$

A) *-15* B) *-18*
C) *-9* D) *-12*

44. Agar $a=6^{3x-2y}$ va $b=6^{3x+2y}$ bo'lsa, $4\cdot6^x+3\cdot6^y$ ni a va b orqali ifodalang.

A) $4\cdot\sqrt[4]{ab}+3\cdot\sqrt[6]{\frac{a}{b}}$

B) $4\cdot\sqrt[4]{ab}+3\cdot\sqrt[3]{\frac{a}{b}}$

C) $4\cdot\sqrt[6]{ab}+3\cdot\sqrt[4]{\frac{b}{a}}$

D) $4\cdot\sqrt[3]{ab}+3\cdot\sqrt{\frac{b}{a}}$

45. Hisoblang: $(0{,}5)^{12}\cdot84-(-4)^3$

A) *-63*
B) *-65*
C) *66*
D) *65*

46. Sonlarni o'sish tartibida joylashtiring: $\sqrt[3]{\frac{8}{27}}$; $\sqrt{\frac{16}{25}}$ va $\sqrt{\frac{25}{36}}$

A) $\sqrt[3]{\frac{8}{27}}<\sqrt{\frac{25}{36}}<\sqrt{\frac{16}{25}}$

B) $\sqrt{\frac{25}{36}}<\sqrt{\frac{16}{25}}<\sqrt[3]{\frac{8}{27}}$

C) $\sqrt{\frac{16}{25}}<\sqrt[3]{\frac{8}{27}}<\sqrt{\frac{25}{36}}$

D) $\sqrt[3]{\frac{8}{27}}<\sqrt{\frac{16}{25}}<\sqrt{\frac{25}{36}}$

47. Hisoblang: $\sqrt{6\frac{1}{4}}+\sqrt{0{,}25}$

A) *5*
B) *3*
C) *2*
D) *4*

48. Hisoblang: $\sqrt{12\frac{1}{4}}+3\cdot\sqrt{0{,}25}$

A) *6* B) *3*
C) *4* D) *5*

49. Hisoblang: $\left(\frac{3-\sqrt{15}}{5-\sqrt{15}}\right)^2$

A) *0,3*
B) *0,5*
C) *1,5*
D) *0,6*

Sonli ketma-ketliklar, progressiyalar

1. Quyidagilardan qaysi biri 4; 7; 10; 13; ... arifmetik progressiyaning hadi bo'la olmaydi?

A) *32* B) *37*
C) *49* D) *31*

2. Maxraji musbat bo'lgan (b_n) geometrik progressiyada $b_3 = 9$ va $b_1 + b_2 = 4$ bo'lsa, b_5 ni toping.

A) *81* B) *54*
C) *27* D) *162*

3. Arifmetik progressiyaning dastlabki bir nechta hadlari berilgan: 3; 6; 9; 12; ... . Quyidagi sonlardan qaysi biri bu progressiyaning hadi bo'ladi?

A) *100*
B) *83*
C) *95*
D) *102*

4. Maxraji 2 ga, $b_1 = -\frac{3}{4}$ ga teng bo'lgan (b_n) geometrik progressiya berilgan. Uning dastlabki 6 ta hadi yig'indisini toping.

A) $-46\frac{1}{4}$
B) $-45\frac{1}{4}$
C) $-47\frac{1}{4}$
D) $-48\frac{1}{4}$

5. Kamayuvchi geometrik progressiyani tashkil etuvchi to'rtta haddan chetki hadlarining yig'indisi 27 ga, o'rta hadlarining ko'paytmasi 72 ga teng bo'lsa, bu progressiyaning birinchi hadini toping.

A) *48* B) *18*
C) *24* D) *36*

6. O'suvchi geometrik progressiyani tashkil etuvchi to'rtta haddan chetki hadlarining yig'indisi 35 ga, o'rta hadlarining yig'indisi 30 ga teng bo'lsa, bu progressiyaning maxrajini.

A) $\frac{2}{3}$ B) $\frac{4}{3}$

C) $\frac{3}{2}$ D) $\frac{3}{4}$

7. O'suvchi geometrik progressiyani tashkil etuvchi to'rtta haddan chetki hadlarining yig'indisi 35 ga, o'rta hadlarining yig'indisi 30 ga teng bo'lsa, bu progressiyaning to'rtinchi hadini toping.

A) *18*
B) *36*
C) *12*
D) *27*

8. Kamayuvchi geometrik progressiyani tashkil etuvchi to'rtta haddan chetki hadlarining yig'indisi 35 ga, o'rta hadlarining yig'indisi 30 ga teng bo'lsa, bu progressiyaning birinchi hadini toping.

A) *24*
B) *18*
C) *36*
D) *27*

9. Agar $b = -3$ bo'lsa, $\frac{(b^{17}-1)(b-1)}{b^{16}+b^{15}+b^{14}+\ldots+b+1}$ ifodaning qiymatini toping.

A) *15* B) *8*
C) *16* D) *4*

10. x ning qanday qiymatida $\frac{8}{x-4}; \frac{1}{3}$ *va* $\frac{7-x}{x-4}$ berilgan tartibda arifmetik progressiyaningketma-ket hadlari bo'ladi?

A) $8\frac{1}{5}$
B) $10\frac{3}{5}$
C) $10\frac{1}{5}$
D) $8\frac{3}{5}$

11. Sakkizta haddan iborat arifmetik progressiyaning toq o'rindagi hadlari yig'indisi 168 ga, juft o'rindagi hadlari yig'indisi 200 ga teng. Shu progressiyaning yettinchi hadini toping.

A) *58*
B) *66*
C) *72*
D) *68*

12. Arifmetik progressiyada $a_{n+1} = a_n - 2$ $(n \in N)$ va $a_4 = 4$ bo'lsa, uning dastlabki 12 ta hadi yig'indisini toping.

A) *18* B) *-18*
C) *12* D) *-12*

13. Arifmetik progressiyaning dastlabki 3 ta hadi $n + 3$; $n + 9$; $n + 15$ ketma-ketlikdan iborat. Progressiyaning o'n birinchi hadi 67 ga teng bo'lsa, uning to'rtinchi hadini toping.

A) *22*
B) *19*
C) *24*
D) *25*

14. Umumiy hadi $x_n = \frac{4n}{3} + 1$ formula bilan berilgan ketma-ketlikning dastlabki o'n sakkizta hadining o'rta arifmetigini toping.

A) $15\frac{1}{4}$
B) $13\frac{2}{3}$
C) $15\frac{2}{3}$
D) $13\frac{5}{6}$

15. Agar $a_3 + a_6 + a_9 + ... + a_{3n} = 828$ va $a_{n+3} + a_{2n} = 36$ bo'lsa, a_1; a_2; a_3; ...; a_{3n} arifmetik progressiyaning hadlari sonini toping.

A) *138* B) *142*
C) *96* D) *108*

16. Beshinchi hadi 24 ga teng bo'lgan arifmetik progressiyaning dastlabki o'n beshta hadi yig'indisi 540 ga teng. Progressiyaning uchinchi hadini toping.

A) *19* B) *13*
C) *16* D) *21*

17. 13, 6; 14, 2; 14, 8; ...; 21, 4 sonlar arifmetik progressiyaning ketma-ket hadlari bo'lsa, ularning yig'indisini toping.

A) *220,5* B) *225,6*
C) *245* D) *215*

18. $m + 5$; $2m + 7$; $3m + 9$; ... hadlari bilan berilgan arifmetik progressiyaning dastlabki sakkizta hadi yig'indisi 204 ga teng. m ning qiymatini toping.

A) *1* B) *3*
C) *2* D) *-1*

19. Agar geometrik progressiyaning umumiy hadi $b_n = 3 \cdot 2^n$ bo'lsa, $b_1^2 + b_2^2 + b_3^2 + \ldots + b_2^7$ yig'indini hisoblang.

A) $3 \cdot (2^{14} - 1)$
B) $12 \cdot (2^{14} - 1)$
C) $12 \cdot (2^{16} - 1)$
D) $3 \cdot (2^{16} - 1)$

20. (a_n) arifmetik progressiyaning dastlabki o'n ikkita hadining yig'indisi 432 ga teng. Agar $a_9 - a_5 = 16$ bo'lsa, to'rtinchi hadini toping.

A) *28*
B) *26*
C) *22*
D) *24*

21. Arifmetik progressiyaning yettinchi hadi birinchi hadining 25 %iga teng. Agar $a_2 + a_4 + a_6 = 90$ bo'lsa, birinchi va beshinchi hadining yig'indisini toping.

A) *82* B) *76*
C) *78* D) *72*

22. (a_n) arifmetik progressiyaning dastlabki o'n to'rta hadining yig'indisi 525 ga teng. Agar $a_7 - a_3 = 12$ bo'lsa, beshinchi hadini toping.

A) *27*
B) *33*
C) *30*
D) *28*

Algebraik ifodalar

1. $x = 4$ bo'lsa, $\dfrac{x^2 - 4}{4x^2} \cdot \dfrac{2x}{x + 2}$ ifodaning qiymatini toping.

A) *0,25*
B) *0,02*
C) *0,01*
D) *0,05*

2. $a = 19$; $b = 8{,}2$ bo'lsa, $\dfrac{4b}{a - b} \cdot \dfrac{a^2 - ab}{8b}$ ifodaning qiymatini toping.

A) *9,5*
B) *3,5*
C) *0,5*
D) *2,5*

3. Agar $P = 3a^2 + 4b$, $Q = -2a^2 - 3b$ bo'lsa, $P - Q - 4b$ ni toping.

A) $5a^2 - 3b$
B) $-5a^2 + 3b$
C) $5a^2 + 3b$
D) $-5a^2 - 3b$

4. $2(4x - 3y) - 3(3y + 4x)$ ifodani soddalashtiring.

A) $4x - 3y$
B) $-4x + 3y$
C) $-4x - 3y$
D) $4x + 3y$

5. Agar $x = 4$, $y = 3$ bo'lsa, $xy^2x^2y - 11xyxy$ ifodaning qiymatini toping.

A) -72 B) -144
C) 144 D) 72

6. $3(5a - 3) - 3(4a - 5) + 4(a - 5)$ ifodani soddalashtiring.

A) $-7a + 14$
B) $-7a - 14$
C) $7a + 14$
D) $7a - 14$

7. Ko'phadlarni ko'paytiring:
$(2a + 4)\cdot(4a - 3)$

A) $8a^2 + 10a - 12$
B) $8a^2 + 22a - 12$
C) $8a^2 - 22a - 12$
D) $8a^2 - 10a - 12$

8. Ko'phadlarni ko'paytiring:
$x^2 + 2x - 1\cdot(x - 1)$

A) $x^3 - x^2 - 3x + 1$
B) $x^3 + x^2 + 3x + 1$
C) $x^3 - x^2 + 3x + 1$
D) $x^3 + x^2 - 3x + 1$

9. $\left(-1\frac{1}{3}a^5b^3c^2\right):\left(-\frac{2}{3}a^2b^2c^2\right)$ bo'lish amalini bajaring.

A) $\frac{8}{9}a^3b$
B) $-2a_3b$
C) $-\frac{8}{9}a^3b$
D) $2a^3b$

10. Ifodani soddalashtiring:
$(3a^2b^3)^3:(-3a^2b^4)^2$

A) $\frac{3}{2}a^2b$
B) $-\frac{3}{2}a^2b$
C) $3a^2b$
D) $-3a^2b$

11. Ko'paytuvchilarga ajrating:
$x(3x - 2y) - 6x + 4y.$

A) $(x + 2)\cdot(2y - 3x)$
B) $(x + 2)\cdot(3x - 2y)$
C) $(x - 2)\cdot(3x - 2y)$
D) $(x - 2)\cdot(3x + 2y)$

12. Ko'paytirishni bajaring:

$$\left(2x^2 - \frac{1}{3}y\right)\cdot\left(2x^2 + \frac{1}{3}y\right)$$

A) $8x^4 - \frac{2}{9}y^2$

B) $4x^4 - \frac{2}{9}y^2$

C) $8x^4 - \frac{1}{9}y^2$

D) $4x^4 - \frac{1}{9}y^2$

13. Ifodani soddalashtiring:

$$\frac{4(a+b)}{5(a^2+b^2)} : \frac{a^2-b^2}{(a+b)^2-2ab}$$

A) $\frac{4}{5(a-b)}$

B) $\frac{4}{5(a+b)}$

C) $-\frac{4}{5(a-b)}$

D) $-\frac{4}{5(a+b)}$

14. Ko'paytuvchilarga ajrating:

$(a-b)^2 - c^2$

A) $(a-b-c)\cdot(a-b+c)$

B) $(a-b-c)\cdot(a+b-c)$

C) $(a-b-c)\cdot(-a-b+c)$

D) $(a+b-c)\cdot(a-b+c)$

15. Ko'paytuvchilarga ajrating:

$7a^4b^2 - 63a^2c^2$

A) $7a^2(ab-9c)\cdot(ab+9c)$

B) $7a^2(a-3c)\cdot(a+3c)$

C) $7a^2(ab-3c)\cdot(ab+3c)$

D) $7a^2(b-3c)\cdot(b+3c)$

16. Ifodani soddalashtiring:

$$\frac{25-x^2}{x^2+7x+10}$$

A) $\frac{5-x}{x+2}$

B) $\frac{x-5}{x+2}$

C) $\frac{5+x}{x+2}$

D) $\frac{5+x}{x-2}$

17. Ifodani soddalashtiring:

$$\frac{35a^7}{b^8}\cdot\frac{b^4\cdot a^{-7}}{7b^{-4}}$$

A) $5a^7$ B) $5b^4$

C) $\frac{5a^7}{b^4}$ D) 5

18. Ko'paytuvchilarga ajrating:

$x^2 - y^2 - x - y.$

A) $(x+y)(y-1-x)$

B) $(x+y)(x-1-y)$

C) $(x+y)(x-1+y)$

D) $(x+y)(x+1+y)$

19. Ko'paytuvchilarga ajrating:
$y^2 - x^2 + x - y$.
A) $(x - y)\,(x - 1 + y)$
B) $(y - x)\,(x - 1 + y)$
C) $(y - x)\,(x + 1 + y)$
D) $(x - y)\,(x + 1 + y)$

20. Soddalashtiring: $\dfrac{\left(3^{k+1} + 7 \cdot 3^k\right)^3}{\left(9^{k+1} + 9^k\right)^2}$
A) $10 \cdot 9^k$ B) $\dfrac{10}{9^k}$
C) $\dfrac{10}{3^k}$ D) $10 \cdot 3^k$

21. Ko'phadlarni ko'paytiring:
$(a^2 + 2a + 4) \cdot (2a - 4)$
A) $2a^3 - 16$
B) $2a^3 - 4a - 16$
C) $2a^3 + 4a - 16$
D) $2a^3 + 16$

22. Ko'phadlarni ko'paytiring:
$a^2 + 3a + 9 \cdot (a - 3)$
A) $a^3 - 27$
B) $a^3 + 3a - 27$
C) $a^3 + 27$
D) $a^3 - 3a - 27$

23. Ko'phadlarni ko'paytiring:
$(x + 2) \cdot (x - 2) \cdot (x^2 + 4)$
A) $x^4 - 16$ B) $x^4 - 4x^2 - 16$
C) $x^4 + 16$ D) $x^4 + 4x^2 - 16$

24. Ko'paytuvchilarga ajrating:
$(a + b)^2 - c^2$
A) $(a - b - c) \cdot (a + b + c)$
B) $(a + b - c) \cdot (a - b - c)$
C) $(a + b - c) \cdot (a + b + c)$
D) $(a + b - c) \cdot (a - b + c)$

25. Algebraik ifodaning qiymatini toping. $0{,}25ab - 0{,}3b^2$, bunda $a = 4$ va $b = 3$.
A) $0{,}3$ B) 3
C) -3 D) $-0{,}3$

26. Soddalashtiring:
$$\left(\frac{5ab^{-1}}{9} - \frac{9ba^{-1}}{5}\right) : \left(\frac{5ab^{-1}}{9} + \frac{9ba^{-1}}{5} - 0{,}5^{-1}\right) : \left(\left(1 + \frac{9ba^{-1}}{5}\right) \cdot \frac{5a}{5a - 9b}\right)$$
A) 5 B) 1
C) 25 D) 10

27. Ifodaning qiymatini toping:
$\sqrt[6]{(x - 8{,}5)^6} + \sqrt[4]{(x - 12{,}5)^4}$,
bunda $x = 9{,}4$.
A) $5{,}4$
B) 3
C) 5
D) 4

28. Agar $P(x)= x^2 + mx - 3$ va $P(-1) = 4$ bo'lsa, $P(-2)$ ni toping.

A) *12*
B) *9*
C) *6*
D) *13*

29. Agar $n \in N$ bo'lsa,

$$\frac{1}{a^{2n} - b^{2n}} + \frac{1}{a^n + b^n} - \frac{1}{a^n - b^n}$$

ifodani soddalashtiring.

A) $\frac{1 + 2b^n}{a^{2n} - b^{2n}}$
B) $\frac{1 - 2a^n}{a^{2n} - b^{2n}}$
C) $\frac{1 - 2b^n}{a^{2n} - b^{2n}}$
D) $\frac{1 + 2a^n}{a^{2n} - b^{2n}}$

30. Agar $\frac{a}{b} = 7 - \sqrt{40}$ bo'lsa, $\frac{\sqrt{a} - \sqrt{5b}}{\sqrt{b}}$ ifodaning qiymatini toping.

A) $-\sqrt{5}$
B) $-\sqrt{2}$
C) $\sqrt{5}$
D) $2\sqrt{2}$

31. Agar $\frac{a}{b} = 10 - \sqrt{84}$ bo'lsa, $\frac{\sqrt{7b} - \sqrt{a}}{\sqrt{b}}$ ifodaning qiymatini toping.

A) $-2\sqrt{3}$
B) $\sqrt{3}$
C) $-\sqrt{7}$
D) $\sqrt{7}$

32. Agar $(2x - 1)^{10} \cdot (x + 1)^2 = a_{12}x^{12} + a_{11}x^{11} + a_{10}x^{10} + \ldots + a_1x + a_0$ bo'lsa, $a_0 + a_1 + a_2 + \ldots + a_{11} + a_{12}$ yig'indini toping.

A) *16* B) *1*
C) *1024* D) *4*

33. $m = \frac{1}{4}$ bo'lsa, $\frac{2m - 4m^2}{m + 1} \cdot \frac{m + 1}{2m^2}$ ifodaning qiymatini toping.

A) *2* B) *1*
C) *8* D) *4*

34. $a = 0{,}3$; $b = -0{,}35$ bo'lsa, $\frac{(a - 2b)^2 - 4b^2}{a}$ ifodaning qiymatini toping.

A) *1,7*
B) *1,4*
C) *0,7*
D) *2,7*

35. $b = \sqrt{0,3}$ bo'lsa, $(b-2)^2 - 4b(2b-1)$ ifodaning qiymatini toping.

A) *0,9* B) *1,09*
C) *0,09* D) *1,9*

36. $a = \sqrt{5}-1$; $b = \sqrt{5}+1$ bo'lsa, $\frac{b}{a^2+ab} : \frac{b^2}{a^2-b^2}$ ifodaning qiymatini toping.

A) $-1,5$
B) $-0,5$
C) *0,5*
D) *1,5*

37. $x = 1$; $y = -0,2$ bo'lsa, $\left(\frac{1}{y} - \frac{1}{x+y}\right) \cdot \frac{x^2-y^2}{x}$ ifodaning qiymatini toping.

A) -4 B) -2
C) -3 D) -6

38. $b = -\frac{15}{16}$ bo'lsa, $\frac{64b^2+128b+64}{b} : \left(\frac{4}{b}+4\right)$ ifodaning qiymatini toping.

A) *1*
B) *2*
C) *3*
D) *4*

39. Agar $x = \sqrt{11}$ bo'lsa, $\sqrt{x-3}+1-\frac{x-12}{\sqrt{x-3}-3}$ ni hisoblang.

A) *2* B) *4*
C) -2 D) -4

40. Agar $x = 5$ bo'lsa, $(4-x)^{-1} \cdot \sqrt{x^3-9x^2+24x-16}$ ifodaning qiymatini toping.

A) *2* B) *3*
C) -1 D) -2

41. Agar $x = 15$ bo'lsa, $\left(\frac{x\sqrt{x}-27}{x-9} + \frac{3\sqrt{x}}{\sqrt{x}+3}\right) : \left(\frac{6}{3-\sqrt{x}} - 1\right) - 3$ ifodaning qiymatini toping.

A) -4 B) $-\sqrt{15}$
C) $\sqrt{15}$ D) *4*

42. $\frac{2a^{-\frac{1}{6}} - \sqrt[3]{ab}}{a^{\frac{2}{3}}b^{\frac{1}{3}} - 2\sqrt[6]{a}} - \frac{4}{\sqrt[3]{a}}$ ifodaning qiymatini $a = 125$, $b = 0,3$ da toping.

A) $\frac{2}{5}$ B) *1*
C) -1 D) $\frac{1}{3}$

43. $a \in (-3; -1)$ bo'lsa, ifodani soddalashtiring.

$$\frac{|1-a^2|}{1+a} + \frac{2|9-a^2|}{a-3} - \frac{|a^2-25|}{5+a}$$

A) $-4a$ B) $-a-2$
C) -12 D) $-a-6$

44. $(3-2x)^2 - 4(x-3)^2 - 3\left(x-3\frac{2}{3}\right)$ ifodaning $x = -\frac{1}{9}$ dagi qiymatini toping.

A) 14 B) $\frac{4}{3}$
C) $-\frac{1}{3}$ D) -17

45. Agar $a = -2$ bo'lsa, $\frac{a^9-1}{a^6+a^3+1}$ ni toping.

A) 8 B) -9
C) 9 D) -8

46. Ifodani soddalashtiring:

$$\frac{\left(x-\frac{1}{y}\right)^2 \cdot \left(x+\frac{1}{y}\right)^3}{\left(y-\frac{1}{x}\right)^2 \cdot \left(y+\frac{1}{x}\right)^3}$$

A) $\frac{y}{x}$ B) $\frac{y^5}{x^5}$
C) $\frac{x^5}{y^5}$ D) $\frac{x}{y}$

47. Ifodani soddalashtiring:

$$\left(1-\frac{a}{a+b}\right) \cdot \left(a-\frac{ab}{a+b}\right) : \frac{a^2}{(a+b)^2}$$

A) b B) $\frac{b}{a}$
C) $\frac{a^2}{b^2}$ D) $\frac{a}{b}$

48. $-(6y^3 - 4xy^2):(-y^2) - (3xy^2 + 2x^2y):\left(\frac{1}{2}xy\right)$ ifodaning $x = -\frac{5}{16}$ va $y = \frac{1}{8}$ dagi qiymatini toping.

A) 5 B) 16
C) -5 D) $2, 5$

49. Agar $m + n = 12$ bo'lsa, $\frac{m^2 - n^2 + 6(n+m)}{m^2 - (6-n)^2}$ ifodaning qiymatini toping.

A) 2 B) 4
C) $\frac{1}{2}$ D) $\frac{1}{4}$

50. Agar $xy > 0$ va $xy^{-1} + x^{-1}y = 2$ bo'lsa, $\frac{xy - 4x^2}{5xy - 2y^2}$ ifodaning qiymatini toping.

A) -1 B) 0
C) 2 D) 1

51. Agar $xy = 5$ va $x + y = -5$ bo'lsa, $(3 + 2x)^2 \cdot y + (3 + 2y)^2 \cdot x$ ifodaning qiymatini toping.

A) -25
B) 0
C) -5
D) 5

52. $(2x - 3)^2 - 4(2 - x)^2 - 3\left(x - 1\frac{1}{3}\right)$ ifodaning $x = \frac{2}{3}$ dagi qiymatini toping.

A) $2\frac{1}{3}$
B) -1
C) $-2\frac{1}{3}$
D) -3

53. x va y lar uchun $y^2 + 2x(x + y) + 3(2x + 3) = 0$ tenglik o'rinli bo'lsa, $\frac{x^2 + y^2}{6}$ ifodaning qiymatini toping.

A) $\frac{4}{3}$
B) 3
C) 2
D) 1

Trigonometriya asoslari

1. $\cos 11\alpha + \cos 9\alpha$ ifodani soddalashtiring.

A) $2\sin\alpha\sin 2\alpha$
B) $2\cos 2\alpha\cos\alpha$
C) $2\cos 10\alpha\cos\alpha$
D) $2\sin 10\alpha\cos 4\alpha$

2. Ifodani soddalashtiring: $\sin\alpha - \sin\alpha \cdot \cos 2\alpha$.

A) $\cos 3\alpha$ B) $\sin 3\alpha$
C) $\cos^3\alpha$ D) $\sin^3\alpha$

3. Ifodani ko'paytma shaklida ifodalang: $\cos 3\alpha + \cos 4\alpha$.

A) $8\sin\frac{a}{2}\cos\frac{7a}{2}$
B) $2\cos\frac{a}{2}\cos\frac{7a}{2}$
C) $4\sin\frac{a}{2}\cos\frac{7a}{2}$
D) $-8\sin\frac{a}{2}\cos\frac{7a}{2}$

4. Hisoblang: $4 \sin\frac{\pi}{6}\sqrt{3}\cos\frac{\pi}{6}$

A) $\frac{5\sqrt{3}}{2}$ B) $\frac{1}{2}$

C) *3* D) $3\frac{1}{2}$

5. $\sin\frac{15\pi}{4}$ ni hisoblang.

A) $-\frac{\sqrt{3}}{2}$

B) $\frac{\sqrt{2}}{2}$

C) $-\frac{1}{2}$

D) $-\frac{\sqrt{2}}{2}$

6. tg930° ni hisoblang.

A) $-\sqrt{3}$ B) $-\frac{\sqrt{3}}{3}$

C) $\frac{\sqrt{3}}{3}$ D) $\sqrt{3}$

7. tg870° ni hisoblang.

A) $-\sqrt{3}$

B) $\sqrt{3}$

C) $-\frac{\sqrt{3}}{3}$

D) $\frac{\sqrt{3}}{3}$

8. $ctg\frac{15\pi}{4}$ ni hisoblang.

A) $-\frac{\sqrt{3}}{3}$ B) *0*

C) *-1* D) *1*

9. Soddalashtiring: $tg\frac{a}{4}\cdot cos\frac{a}{4}$

A) $cos\frac{a}{4}$

B) $sin\frac{a}{4}$

C) $sin\frac{a}{2}$

D) $sin\frac{3a}{4}$

10. Hisoblang: $\cos 2\pi - \cos\frac{5\pi}{2}$

A) *-1*

B) *0*

C) *1*

D) $-\frac{\sqrt{2}}{2}$

11. Soddalashtiring:

$\cos 3\alpha\cdot\cos 2\alpha + \sin 2\alpha\cdot\sin 3\alpha$.

A) $sin5\alpha$

B) $cos5\alpha$

C) $sin\alpha$

D) $cos\alpha$

12. Soddalashtiring:
$\cos 3\alpha \cdot \cos 2\alpha + \sin 2\alpha \cdot \sin 3\alpha$.
A) $\sin 5\alpha$
B) $\cos 5\alpha$
C) $\sin\alpha$
D) $\cos\alpha$

13. (1; 0) nuqtani koordinatalar boshi atrofida $\alpha = 750°$ burchakka burish natijasida hosil bo'lgan nuqta qaysi chorakda joylashadi?
A) *II* B) *IV*
C) *I* D) *III*

14. Tenglamani yeching:
$\sqrt{2} \cdot \sin\frac{\pi x}{2} = \sqrt{2}$
A) $1 + 4k,\ k \in Z$
B) $-1 + 4k,\ k \in Z$
C) $1 + 2k,\ k \in Z$
D) $-1 + 2k,\ k \in Z$

15. Hisoblang: $\dfrac{1 + tg\frac{\pi}{3}}{1 - tg\frac{\pi}{3}}$
A) $2 + \sqrt{3}$
B) $-2 - \sqrt{3}$
C) $-2 + \sqrt{3}$
D) $2 - \sqrt{3}$

16. Hisoblang: $\sin 390° + \operatorname{tg} 45°$
A) $\dfrac{2+\sqrt{3}}{2}$
B) $\dfrac{2-\sqrt{3}}{2}$
C) *1,5*
D) *-0,5*

17. Soddalashtiring:
$1 + \operatorname{tg}^2\alpha - \dfrac{1}{\cos^2\alpha}$
A) *1*
B) $-4tg^2\alpha$
C) *0*
D) $4tg^2\alpha$

18. Soddalashtiring: $\dfrac{\cos^2\alpha \cdot tg^2\alpha}{\sin^2\alpha}$
A) $ctg^4\alpha$ B) $tg^4\alpha$
C) *0* D) *1*

19. Agar $\sin x = A$ va $\cos x = B$ bo'lsa, $A^2 - B^2$ ifodani toping.
A) $\cos 2x$ B) *1*
C) $-\cos 2x$ D) *-1*

20. Agar $\sin x = A$ va $\cos x = B$ bo'lsa, $A^2 + B^2$ ning qiymatini toping.
A) *-1*
B) $\cos 2x$
C) *0*
D) *1*

21. Agar $\sin\alpha = \frac{2}{3}$ va $\frac{\pi}{2} < \alpha < \pi$ bo'lsa, $\cos\alpha$ ni toping.

A) $\frac{\sqrt{7}}{3}$

B) $-\frac{\sqrt{7}}{3}$

C) $-\frac{\sqrt{5}}{3}$

D) $\frac{\sqrt{5}}{3}$

22. Hisoblang: $\sin^6 2 - 3\sin^4 2 + 3\sin^2 2 + \cos^6 2 + 2$

A) *2* B) *3*

C) *1* D) *0*

23. Hisoblang:

$$sin^6\frac{\pi}{9} - 3sin^4\frac{\pi}{9} + 2sin^2\frac{\pi}{9} + cos^6\frac{\pi}{9} - cos^2\frac{\pi}{9} + 1$$

A) *1*

B) *–1*

C) *2*

D) *0*

24. Hisoblang: $\cos^6 12° - 3\cos^4 12° + 2\cos^2 12° + \sin^6 12° - \sin^2 12° + 2$

A) *2*

B) *1*

C) *–2*

D) *3*

25. Agar $\text{tg}\alpha = \sqrt{5}$ bo'lsa, $\frac{4\sin^4 a}{5sin^2 a + 15cos^2 a}$ ifodaning qiymatini toping.

A) $\frac{5}{24}$ B) $\frac{1}{6}$

C) $\frac{5}{6}$ D) $\frac{5}{12}$

26. Ifodani soddalashtiring:

$\sin\alpha + \cos(\alpha - 6\pi)\cdot ctg\left(\frac{a}{2} - \frac{13\pi}{4}\right)$

A) *–1* B) *sinα*

C) *1* D) *cosα*

27. Ifodani soddalashtiring:

$\sin 4\alpha + \cos(4\alpha - 8\pi)\cdot ctg\left(2a - \frac{\pi}{4}\right) - 1$

A) *–1*

B) *cos2α – 1*

C) *–2*

D) *sin2α – 1*

28. Ifodani soddalashtiring:

$\sin 6\alpha + \cos(6\alpha - 12\pi)\cdot ctg\left(3a + \frac{7\pi}{4}\right) + 2$

A) *1* B) *cos3α + 1*

C) *sin3α + 1* D) *2*

29. Ifodani soddalashtiring:

$$\sin 2\alpha + \sin 2\alpha\left(2\alpha - \frac{14\pi}{3}\right) + \\ + \sin\left(2\alpha + \frac{8\pi}{3}\right) - 1$$

A) -1
B) $cos2\alpha$
C) 1
D) $sin2\alpha$

30. Hisoblang:

$$cos^4\frac{17\pi}{8} + cos^4\frac{13\pi}{8} + cos^4\frac{11\pi}{8} + \\ + cos^4\frac{9\pi}{8} + 2$$

A) $\frac{3}{2}$ B) $\frac{3}{4}$
C) $\frac{7}{2}$ D) $\frac{5}{2}$

31. Hisoblang:

$$cos^4\frac{17\pi}{8} + cos^4\frac{13\pi}{8} + cos^4\frac{19\pi}{8} + \\ + cos^4\frac{9\pi}{8}$$

A) $\frac{3}{4}$
B) $\frac{3}{2}$
C) 1
D) $\frac{1}{2}$

32. Hisoblang: $\frac{sin96°}{16\sin 6°} -$
$- \cos 6° \cdot \cos 12° \cdot \cos 24° \cdot \cos 48°$

A) $\frac{1}{2}$
B) 1
C) $\frac{3}{4}$
D) 0

33. Hisoblang:

$$\frac{cos23° \cdot cos56° - cos67° \cdot cos34°}{cos39° \cdot cos40° - cos50° \cdot cos51°} + 1$$

A) $\frac{3}{2}$ B) 2
C) $\frac{3}{4}$ D) 1

34. $\left(\frac{1}{\cos^2 a} - \frac{1}{\sin^2 a}\right) \cdot \frac{\sin 2atga}{1 - tg^2 a} + 2$
ifodani soddalashtiring.

A) 1
B) $sin\alpha$
C) $cos\alpha$
D) 0

35. $y = \cos^2 x - tgx \cdot ctgx + 1$
funksiyaning qiymatlari sohasini toping.

A) $(-1; 0) \cup (0; 1)$
B) $[0; 1]$
C) $(0; 1)$
D) $[1; 2]$

36. Quyidagilardan qaysi biri $\cos^2 5x + \sin^2 3x = 1$ tenglamaning umumiy yechimi bo'ladi?

A) $x = \frac{\pi k}{2},\ k \in Z$

B) $x = \frac{\pi k}{4},\ k \in Z$

C) $x = \pi k,\ k \in Z$

D) $x = \frac{\pi k}{8},\ k \in Z$

37. $\cos 6x = \cos 5x$ tenglamaning eng kichik musbat yechimini toping.

A) $\frac{\pi}{11}$

B) $\frac{2\pi}{11}$

C) $\frac{4\pi}{11}$

D) $\frac{6\pi}{11}$

38. $\sin 4x = \sin 5x$ tenglamaning eng kichik musbat yechimini toping.

A) $\frac{8\pi}{9}$

B) $\frac{\pi}{9}$

C) $\frac{2\pi}{3}$

D) $\frac{2\pi}{9}$

39. $(\sin x - 2\cos x)\cdot(1 + \cos x) = 3\sin^2 x$ tenglamaning $[2\pi;\ 4\pi]$ oraliqdagi yechimini toping.

A) 3π

B) $\frac{5\pi}{2}$

C) $\frac{7\pi}{3}$

D) $\frac{5\pi}{3}$

40. Tenglamani yeching:
$\operatorname{tg}(2x)\cdot\operatorname{tg}(3x - \pi) = 1$

A) $x = \frac{\pi}{5} + \frac{\pi k}{5},\ k \in Z$

B) $x = \frac{\pi}{10} + \frac{\pi k}{5},\ k \in Z$

C) $x = \frac{\pi}{2} + \frac{\pi k}{5},\ k \in Z$

D) $x = \frac{\pi}{3} + \frac{\pi k}{5},\ k \in Z$

41. Quyidagilardan qaysi biri $\cos^4 12x - \sin^4 12x = \cos 22x$ tenglamaning umumiy yechimi bo'ladi?

A) $x = \pi k,\ k \in Z$

B) $x = \frac{\pi k}{4},\ k \in Z$

C) $x = \frac{\pi k}{5}\pi k,\ k \in Z$

D) $x = \frac{\pi k}{23}\ \pi k,\ k \in Z$

42. Hisoblang: $\sin 16^\circ + \cos 16^\circ \cdot \operatorname{tg} 37^\circ$

A) -1
B) 0
C) 2
D) 1

43. Hisoblang: $\cos^2 67^\circ + \cos^2 53^\circ + \cos 67^\circ \cdot \cos 53^\circ$

A) $\frac{1}{2}$ B) $\frac{3}{4}$
C) $\frac{2}{3}$ D) 1

44. Agar $\sin\alpha = -\frac{1}{5}$ bo'lsa, $\frac{sin2a - sin3a + sin5a}{1 + \cos a - 2\sin^2 2a}$ ning qiymatini toping.

A) $\frac{5}{4}$ B) $\frac{2}{5}$
C) $-\frac{4}{3}$ D) $-\frac{2}{5}$

45. Agar $\sin\alpha = \frac{2}{7}$ bo'lsa, $\frac{sin2a - sin3a + sin5a}{1 + \cos a - 2\sin^2 2a}$ ning qiymatini toping.

A) $\frac{7}{4}$
B) $\frac{4}{7}$
C) $-\frac{4}{5}$
D) $\frac{5}{4}$

46. Agar $\operatorname{tg}\alpha = \frac{1}{2}$ bo'lsa, $\frac{sina + sin3a + sin5a + sin7a}{cosa - cos3a + cos5a - cos7a}$ ning qiymatini toping.

A) 1
B) $\frac{1}{2}$
C) 2
D) -1

Ko'rsatkichli funksiya

1. Agar $x \neq 0$ bo'lsa, $5 + 5^{2x+y} - 5^{x+1} - 5^{x+y} = 0$ tenglamadagi x ni y orqali ifodalang.

A) $x = -1 - y$
B) $x = y - 1$
C) $x = y + 1$
D) $x = 1 - y$

2. Agar $ax = x^{b+1} - 1$ va $c = x^{3-b}$ bo'lsa, c ni x va a orqali ifodalang.

A) $\dfrac{x^4 - 1}{a}$
B) $\dfrac{x}{ax - 1}$
C) $\dfrac{x^4}{ax + 1}$
D) $\dfrac{x^3}{ax + 1}$

3. Agar $2^x = 73$ bo'lsa, $|x - 7| + |x - 6|$ ifodani soddalashtiring.

A) *1* B) *-1*
C) *2x - 13* D) *13 - 2x*

4. Tengsizlikni yeching: $49 \cdot 7^x < 7^{3x+3}$

A) *(5; +∞)*
B) *(-∞; -1)∪(5; +∞)*
C) *(-∞; -1)*
D) *(-1; 5)*

5. $\left(\frac{1}{4}\right)^x - \left(\frac{1}{2}\right)^x < 12$ tengsizlikning (–5; 7) oraliqqa tegishli bo'lgan butun yechimlari sonini toping.

A) *6* B) *7*
C) *8* D) *4*

6. $\dfrac{9^{x^2-4x+3} - 1}{3^{x^2-x} - 1} = 1$ tenglama ildizlari yig'indisi (agar u bitta bo'lsa, ildizi) 18 sonidan qanchaga kichik?

A) *12* B) *17*
C) *6* D) *11*

7. Agar $2^{x-2} \cdot 3^{x+1} = 15$ tenglamaning ildizi x_0 bo'lsa, $x_0 - \dfrac{1}{\lg 6}$ ni toping.

A) $3\log_6 2$
B) *1*
C) $2\log_6 2$
D) $\log_6 2$

8. $\sqrt{7x - x^2} \cdot (3^x - 5) > 0$ tengsizlikni nechta butun son qanoatlantiradi?

A) *cheksiz ko'p*
B) *0*
C) *5*
D) *7*

9. $\left(\frac{2}{3\sqrt{3}-1}\right)^{4x^2-(x+1)^2} > 1$ tengsizlikni yeching.

A) $\left(-\infty;\frac{2}{3}\right)\cup(1;\infty)$

B) $\left(\frac{2}{3};1\right)$

C) $\left(-\infty;-\frac{1}{3}\right)\cup(1;\infty)$

D) $\left(-\frac{1}{3};1\right)$

10. $2^{2+x}-2^{2-x}=15$ tenglamaning ildizi x_0 bo'lsa, $2x_0+x_0^2$ ni hisoblang.

A) *4* B) *7*
C) *8* D) *6*

11. $8^{1+x}+18^{1+x}=2\cdot27^{1+x}$ tenglamaning ildizi x_0 bo'lsa, $2x_0+x_0^2$ ni hisoblang.

A) *1* B) *0*
C) *2* D) *−1*

12. $8^{4-\frac{x^2}{3}} > \frac{1}{2}$ tengsizlikning eng katta butun yechimini toping.

A) *4*
B) *6*
C) *3*
D) *5*

13. $\left(\frac{3}{2}\right)^{4x+1} > \left(\frac{16}{81}\right)^{1-\frac{x^2}{4}}$ tengsizlikni yeching.

A) *(5; +∞)*
B) *(−∞; −1)∪(5; +∞)*
C) *(−∞; −1)*
D) *(−1; 5)*

14. $5^{\frac{x+4}{x-3}} \le \frac{1}{\sqrt{5}}$ tengsizlikni yeching.

A) $\left[-\frac{5}{3};3\right)$

B) *(3; +∞)*

C) $\left(-\infty;-\frac{5}{3}\right]$

D) $\left(-\infty;-\frac{5}{3}\right]\cup(3;+\infty)$

15. $f(x)=2^{|x|}-3$ funksiyaning qiymatlar sohasini toping.

A) *(−3; +∞)*
B) *(0; +∞)*
C) *[−2; +∞)*
D) *(−2; +∞)*

16. $5\cdot7^{x+1}-7^x=7\cdot5^{2x+1}-5^{2x}$ tenglamaning ildizi quyidagi oraliqlardan qaysi biriga tegishli?

A) *[2; 3)*
B) *[0; 1)*
C) *[1; 2)*
D) *[−1; 0)*

17. $0{,}125 \cdot 4^{2x-3} = \left(\frac{0{,}25}{\sqrt{2}}\right)^{-x}$ tenglamaning.

A) *8*
B) *9*
C) *5*
D) *6*

18. $y = \left(\frac{1}{2}\right)^{x^2-6x+7}$ funksiyaning qiymatlar sohasini toping.

A) *[0; 4]*
B) *(−∞; 4]*
C) *(0; 4]*
D) *[4; ∞)*

19. $y = \left(\frac{1}{3}\right)^{x^2-6x+7}$ funksiyaning qiymatlar sohasini toping.

A) *(0; 9]*
B) *(9; ∞)*
C) *(−∞; 9]*
D) *[0; 9]*

20. $y = 4^{x-4} + 16$ funksiyaning qiymatlar sohasini toping.

A) *[16; ∞)*
B) *(20; ∞)*
C) *(16; ∞)*
D) *(−∞; ∞)*

21. $y = 6^{x-4} + 13$ funksiyaning qiymatlar sohasini toping.

A) *[13; ∞)*
B) *[13; ∞)*
C) *(−∞; ∞)*
D) *(19; ∞)*

22. $b = \frac{1}{2^{-a}}$ va $c = \frac{1}{2^{-b}}$ bo'lsa, a ni c orqali ifodalang.

A) $a = log_2 log_2 c$
B) $a = 2^{1-c}$
C) $a = c$
D) $a = log_2 c$

23. $e^x + 3^{e-x} = 4$ tenglamaning haqiqiy ildizlari yig'indisini toping.

A) *ln 4*
B) *ln 3*
C) *0*
D) *3*

24. $\sqrt{y = 2^{2x} - 3 \cdot 2^{x+1} - 16}$.
funksiyaning aniqlanish sohasini toping.

A) $x \geq 2$
B) $x \geq 3$
C) $x \leq 1,\ x \geq 4$
D) $x \leq 2,\ x \geq 3$

Logarifmik funksiya

1. Tenglamani yeching:

$x^{\frac{\log_5 \log_5 x}{\log_5 x}} = \log_5 14$

A) *25*
B) *5*
C) *7*
D) *14*

2. Hisoblang: $27^{-\frac{1}{3}\log_3 \frac{1}{2} - \log_{27} 2}$

A) $log_3 2$
B) *1/3*
C) *3*
D) *1*

3. Hisoblang:

$30 \log_{\frac{1}{7}} \left(\sqrt[5]{7} \cdot \frac{1}{49} \cdot 5^{\log_{\sqrt{5}} \sqrt[3]{49}} \right)$

A) *7*
B) *14*
C) *1*
D) *-14*

4. $x^{\lg 2} + 2^{\lg x} = 4$ tenglama nechta yechimga ega?

A) *1*
B) *0*
C) *2*
D) *3*

5. Hisoblang: $\frac{3}{7}\left(\log_2 16 + 27^{\log_3 2}\right)^{\log_{12} 49}$

A) *21*
B) *14*
C) *3*
D) *36*

6. $(\lg x^2 - 3x + 1) = \lg(2x - 5)$ tenglamaning ildizlari soni n ta bo'lsa, $n + 5$ ni toping.

A) *9*
B) *6*
C) *8*
D) *5*

7. $\log_3 (x - 5)^2 = 2$ tenglamaning eng katta va eng kichik ildizlari ko'paytmasini toping.

A) *16*
B) *8*
C) *4*
D) *2*

8. $\log_3 (x^2 - 12) + 0{,}5 \log_{\frac{1}{3}} x^2 = 0$

tenglamaning eng katta va eng kichik ildizlari ayirmasini toping.

A) *12*
B) *0*
C) *8*
D) *4*

9. Tenglamani yeching:

$$\log_2\left(\log_{\frac{1}{2}}(\log_{625}(x^2+x-1))\right)=1$$

A) *3; −2*
B) *−3; 2*
C) *3; 2*
D) *−3; −2*

10. $\lg x - x + x\lg x - 1 = 0$ tenglamaning ildizlari soni n ta bo'lsa, $n + 5$ ni toping.

A) *8*
B) *5*
C) *6*
D) *9*

11. Berilgan tenglamaning ildizlari ko'paytmasini toping:

$$3^{2(\log_{11} x)^2} - 4\cdot 3^{(\log_{11} x)^2} + 3 = 0$$

A) *0*
B) *−3*
C) *2*
D) *1*

12. Tenglamaning eng kichik yechimini toping:

$\log_3(x^2 + 4x + 12) = 2$

A) *−1*
B) *3*
C) *−3*
D) *0, 5*

13. $5^{2(\log_{13} x)^2} - 6\cdot 5^{(\log_{13} x)^2} + 5 = 0$ tenglamaning haqiqiy ildizlari ko'paytmasini toping.

A) *1, 5*
B) *2, 5*
C) *1*
D) *2*

14. Tenglama ildizlarining yig'indisini toping:

$\lg(5x - 6) = 2\lg x$.

A) *5*
B) *2*
C) *1*
D) *12*

15. Hisoblang:

$$7^{\frac{1}{\log_{36} 49}} - \log_3\left(\log_2 \sqrt[9]{\sqrt[9]{2}}\right) - 2$$

A) *12*
B) *8*
C) *0*
D) *10*

16. Hisoblang:

$$7\cdot\left(3^{\log_{\sqrt[3]{4}} 4} - 7^{2\log_{343} 8} - 11\right) : 5^{\log_{25} 196}$$

A) *6*
B) *8*
C) *12*
D) *18*

17. Hisoblang:

$\sqrt{(\log_2 3 + 9\log_3 2 - 6)\cdot \log_2 3 + \log_2 24}$

A) *2* B) *$\log_2 9$*
C) *4* D) *6*

18. Agar $f(x) = 2 - \log_3 x^3$ bo'lsa, $f(3) + f\left(\frac{1}{x}\right) = f(x)$ tenglamani yeching.

A) $3\sqrt[6]{3}$
B) $\sqrt[6]{3}$
C) $3\sqrt[3]{3}$
D) $\sqrt[3]{9}$

19. Agar $f(x-2) = \log_2(x^2 - 3x + 8) + 3$ bo'lsa, $f(-2)$ ning qiymatini toping.

A) *3+ $\log_2 18$*
B) *6*
C) *3+ $\log_2 48$*
D) *5*

20. $3\cdot 3^{\lg x^2} + 11\cdot 3^{\lg x} = 4$ tenglamaning haqiqiy ildizini toping.

A) *10*
B) *100*
C) *0,01*
D) *0,1*

21. $(x-2)^{\log_{(x-2)}(49-x^2)} \le 24$ tengsizlikni yeching.

A) *(2; 3)∪(3; 5]*
B) *[5; 7)*
C) *(−7; −5]∪[5; 7)*
D) *(2; 7)*

22. $x^{\log_3 x - 5} = \frac{1}{81}$ tenglamaning ildizlari ko'paytmasini toping.

A) *243*
B) *3*
C) $\frac{1}{3}$
D) *81*

23. Tengsizlikni yeching:

$|x-3|\cdot\left(\log_{\frac{1}{3}}(x-1) + 2\right) > 0$

A) *(1; 10)*
B) *(3; ∞)*
C) *(1; 3)∪(3; 10)*
D) *(3; 10)∪(10; ∞)*

24. Tengsizlikni yeching:

$|x-5|\cdot\left(\log_{\frac{1}{2}}(x-3) + 2\right) > 0$

A) *(5; 7)∪(7; ∞)*
B) *(3; 7)*
C) *(3; 5)∪(5; 7)*
D) *(7; ∞)*

25. $\log_2^2 x - 3 < 2\log_2 x$ tengsizlikni yeching.

A) *(1; 16)*

B) $\left(\frac{1}{8}; 2\right)$

C) $\left(\frac{1}{4}; 8\right)$

D) $\left(\frac{1}{2}; 8\right)$

26. $\log_3(27x)\cdot\log_{(3x)}3 = 2$ tenglamaning ildizi x_0 bo'lsa, $x_0 + 11$ ning qiymatini toping.

A) *38*

B) *3*

C) *14*

D) *20*

27. Agar $0 < a < 1$ bo'lsa, quyidagilardan qaysi biri ma'noga ega?

A) *lglglga*

B) $log_2 log_a log_2 3$

C) $log_a log_a \frac{\pi}{4}$

D) $log_2 log_a (a + 1)$

Tenglamalar

1. Agar $x^2 - 5x + 2 = 0$ bo'lsa, $x_1^2 + x_2^2$ ning qiymatini toping.

A) *15* B) *18*

C) *21* D) *23*

2. $(x^2 + x) + (x^2 + 2x) + ... + (x^2 + 19x) = 1425$ tenglamaning natural ildizi x_0 bo'lsa, x_0 ni toping.

A) *10* B) *5*

C) *8* D) *6*

3. $\sqrt{x+8} - \sqrt{x+4} = 2$ tenglamaning haqiqiy yechimlari nechta?

A) *2* B) *4*

C) *1* D) *0*

4. Tenglama nechta butun ildizlarga ega? $|x^2 + 5x - 14| = -5x - x^2 + 14$

A) *10*

B) *11*

C) *8*

D) *12*

5. Tenglamaning haqiqiy ildizlari yig'indisini (agar yagona bo'lsa, ildizini) toping:

$\sqrt{(2x+1)^2} - 3(2x+5) = -8$

A) *-1*
B) *3*
C) *2*
D) *1*

6. Tenglamaning ildizlari yig'indisini toping:

$x^3 + 2x^2 - 9x - 18 = 0$

A) -2
B) -8
C) *8*
D) *2*

7. Tenglamaning ildizlari yig'indisini toping:

$(x-5)\sqrt{2x-3} = 0$

A) *7,5*
B) *1,5*
C) *8,5*
D) *6,5*

8. $\sqrt{8-x} = x-2$ tenglamaning ildizi qaysi oraliqqa tegishli?

A) *(0; 5)*
B) *(5; 50)*
C) *(50; 100)*
D) *$(-\infty; 0)$*

9. $(x-2)\cdot x^2 + (\sqrt{x})^2 - 2 = 0$ tenglamaning haqiqiy ildizlari yig'indisini toping.

A) *2* B) *-1*
C) *-2* D) *3*

10. Tenglama ildizlarining yig'indisini toping:

$\frac{2}{\sqrt[3]{x^2}} - \frac{3}{\sqrt[3]{x}} + 1 = 0$

A) *9*
B) *10*
C) *11*
D) *8*

11. Tenglama ildizlarining yig'indisini toping:

$\frac{4}{\sqrt[3]{x^2}} - \frac{5}{\sqrt[3]{x}} + 1 = 0$

A) *72*
B) *65*
C) *64*
D) *81*

12. Agar x_1, x_2 lar $x^2 - 5x - 1 = 0$ tenglamaning ildizlari bo'lsa, $\frac{1}{x_1+1} + \frac{1}{x_2+1}$ ni hisoblang.

A) *1,4*
B) *0,6*
C) *2*
D) *1*

13. Tenglamaning haqiqiy ildizlari yig'indisini toping:

$$\frac{2x}{x-3}+\frac{x-3}{x-4}=\frac{7x-27}{x^2-7x+12}$$

A) *0*
B) *2*
C) *3*
D) *ildizga ega emas*

14. $\dfrac{4a^7+3a^6-4a-3}{(4a+3)\cdot(a^4+a^2+1)}$ ifodaning qiymati 1 ga teng bo'ladigan a ning barcha qiymat(lar)ini toping.

A) *0*
B) *2*
C) ± 2
D) $\pm\sqrt{2}$

15. Tenglamani yeching:

$$\frac{5}{4-\dfrac{3}{\dfrac{2(1-2x)}{x-2}}}=\frac{2}{3}$$

A) *8*
B) $\dfrac{1}{11}$
C) $-\dfrac{1}{11}$
D) $-\dfrac{1}{8}$

16. $\dfrac{(x+6)^2-4}{x+8}\cdot(x-4)=48$ tenglamaning ildiziga nisbatan quyidagi mulohazalardan qaysi biri to'g'ri?

A) *tub son*
B) *irratsional son*
C) *manfiy son*
D) *4 ga karrali son*

17. m ning qanday qiymat(lar)ida $\dfrac{m^2-9}{m^2-1}$ va $\dfrac{2m-6}{m-1}$ ifodalar bir-biriga teng bo'ladi?

A) *1; 3* B) *3*
C) *–2* D) *3; –2*

18. Tenglamani yeching.

$$\frac{\dfrac{x+3}{3}-2}{3+\dfrac{1}{3}}-\frac{\dfrac{x-4}{4}+2}{6-2\dfrac{1}{4}}=\frac{\dfrac{x}{12}+2\dfrac{1}{3}}{(1,2)^{-1}}$$

A) *50,5* B) *56,5*
C) *–56,5* D) *–50,5*

19. $x^2-ax=2$ tenglamaning x_1 va x_2 ildizlari $\dfrac{x_1}{x_2}+\dfrac{x_2}{x_1}=-4$ tenglikni qanoatlantirsa, a^2+2 ning qiymatini toping.

A) *3* B) *18*
C) *6* D) *11*

20. Agar $a(x-2)^2 + c(x-2b) = 2(x^2-5x+8)$ tenglik ayniyat bo'lsa, $a+b+c$ ning qiymatini toping.

A) -2 B) 4
C) -4 D) 2

21. $(x^2-12x+10)^2 = (3x+10)^2$ tenglamaning yechimlari sonini toping.

A) 4
B) 2
C) 1
D) 3

22. $\frac{|x-25|}{x} = -6$ tenglamaning ildizlar yig'indisini (agar yagona bo'lsa, ildizini) toping.

A) $3\frac{4}{7}$
B) 1
C) -5
D) $-1\frac{3}{7}$

23. $\frac{1}{|x|} = \frac{7}{x^2+3x}$ tenglamaning ildizlari ko'paytmasini toping.

A) -10
B) -40
C) 4
D) 0

24. $\frac{x^2-5|x|-11}{|x|} = 5$ tenglamaning haqiqiy ildizlari ko'paytmasini toping.

A) -121 B) -11
C) 121 D) 11

25. $\frac{\frac{2}{x-12}+\frac{1}{x+11}}{\frac{3}{x+11}-\frac{2}{x-12}} = \frac{1}{5}$ tenglamaning ildizini toping.

A) $-7\frac{5}{7}$
B) $-6\frac{4}{7}$
C) $2\frac{3}{14}$
D) $18,5$

26. $43-2(x-6(1-2(2-3x))) = 63x$ tenglamaning ildizi x_0 bo'lsa, x_0^2-3 ning qiymatini toping.

A) 1 B) 13
C) -2 D) 6

27. $\frac{1}{|x|} = \frac{6}{x^2+2x}$ tenglamaning ildizlari ko'paytmasini toping.

A) 0 B) 4
C) -8 D) -32

28. Agar $(x; y)$ sonlar jufti $\begin{cases} x^2 + xy + y^2 = 56 \\ x + \sqrt{xy} + y = 8 \end{cases}$ tenglamalar sistemasining ildizi bo'lsa, $x - \sqrt{xy} + y$ ning qiymatini toping.

A) *7* B) *8*
C) *6* D) *5*

29. $\begin{cases} (x^2 - y^2)xy = 180 \\ x^2 - xy - y^2 = -11 \end{cases}$ bo'lsa, xy ni qiymatlarini toping.

A) *20; 9*
B) *–20; –9*
C) *–20; 9*
D) *20; –9*

30. $\dfrac{3x^2 - 10x + 3}{3x - 1} = 3x^2 - 6x - 1$ tenglama nechta turli ildizga ega?

A) *2* B) *1*
C) *0* D) *3*

31. $\dfrac{x^3 - 27}{x^2 - 9} = 3x + 13$ tenglamaning eng katta va eng kichik ildizlari ayirmasini toping.

A) *5,5* B) *7,5*
C) *11,5* D) *9,5*

32. $\sqrt{|x-5|} = x - 7$ tenglamaning haqiqiy ildizi x_0 bo'lsa, $\dfrac{x_0 + 1}{x_0 - 1}$ ni toping.

A) *1,25*
B) *1,4*
C) *1,2*
D) *1,3*

33. Tenglamaning haqiqiy ildizlari yig'indisini toping:
$(x^2 - 11x + 9)^2 = (2x + 9)^2$

A) *20* B) *11*
C) *22* D) *18*

34. Tenglamaning nechta haqiqiy ildizi bor?
$\sqrt{9 - x} \cdot (x^2 - 21x + 110) = 0$

A) *1*
B) *2*
C) *3*
D) *0*

35. Tenglamaning nechta haqiqiy ildizi bor?
$9 - 8 \cdot \sqrt[6]{x} - \sqrt[3]{x} = 0$

A) *1*
B) *0*
C) *2*
D) *3*

36. Tenglamaning nechta haqiqiy ildizi bor?

$\sqrt{x^2+6x-7}-\sqrt{x-1}=0$

A) *10* B) *3*
C) *2* D) *1*

37. $(x^2+5x+1)^2+2x^2+10x=1$ tenglamaning.

A) *−6* B) *−9*
C) *−10* D) *−5*

38. $|5x-26|=x^2+2x+8$ tenglamaning haqiqiy ildizlari yig'indisini toping.

A) *7* B) *−3*
C) *3* D) *−7*

39. $\sqrt[3]{x-3}-\sqrt[3]{x-10}=1$ tenglamaning ildizlari yig'indisini toping.

A) *12*
B) *2*
C) *13*
D) *11*

40. $\sqrt[3]{(x+4)^2}+4\sqrt[3]{(x-3)^2}+$ $+5\sqrt[3]{-x^2-x+12}=0$ tenglama nechta haqiqiy ildizga ega?

A) *1*
B) *3*
C) *0*
D) *2*

41. $\left(x^2+\frac{1}{x^2}\right)-5\left(x+\frac{1}{x}\right)+6=0$ tenglamaning barcha haqiqiy ildizlari yig'indisini toping.

A) *5* B) *4*
C) *2* D) *3*

42. $\left(\frac{|x|+x}{x-2}\right)^2-\frac{12x}{x-2}+5=0$ tenglama nechta haqiqiy ildizga ega?

A) *3* B) *0*
C) *1* D) *2*

43. $x^2-x\cdot\frac{|x-1|}{x-1}-2=0$ tenglamaning haqiqiy ildizlari ko'paytmasini toping.

A) *4*
B) *−4*
C) *−2*
D) *−1*

44. $\sqrt[4]{6x\cdot\left(5+2\sqrt{6}\right)}\cdot$ $\cdot\sqrt{3\sqrt{2x}-2\sqrt{3x}}=x$ tenglama ildizlarining o'rta arifmetik qiymatini toping.

A) *3*
B) *0*
C) *1*
D) *2*

45. $(x^2-6x+6)\cdot(x^2-6x+2)-21=0$ tenglamaning turli haqiqiy ildizlari yig'indisini toping.

A) *12*
B) *9*
C) *6*
D) *3*

46. $\left|2^{4x^2-1}-3\right|=5$ tenglama nechta haqiqiy ildizga ega?

A) *1*
B) *3*
C) *2*
D) *4*

47. $\dfrac{x^2-7|x|+12}{-3x^2+27}=0$ tenglama nechta haqiqiy ildizga ega.

A) *1*
B) *4*
C) *3*
D) *2*

48. $(x^2-5x+3)^2+3x(x^2-5x+3)+2x^2=0$ tenglama nechta haqiqiy ildizga ega?

A) *4*
B) *3*
C) *1*
D) *2*

49. $(x^2-x+1)^2+x(x^2-x+1)-2x^2=0$ tenglama nechta turli haqiqiy ildizga ega?

A) *4* B) *1*
C) *2* D) *3*

50. $(x-2)(x+1)(x+4)(x+7)=19$ tenglama nechta haqiqiy ildizga ega?

A) *1* B) *4*
C) *2* D) *3*

51. $\sqrt[3]{8x-\dfrac{1}{2}}=2-3\sqrt[6]{x-\dfrac{1}{16}}$ tenglamaning haqiqiy ildizi x_0 bo'lsa, $8x_0$ ning qiymatini toping.

A) *5* B) $\dfrac{3}{4}$
C) $\dfrac{5}{8}$ D) $\dfrac{3}{8}$

52. Tenglamani yeching:

$$\frac{x+3}{4^2-1}-\frac{x+3}{6^2-1}+\frac{x+3}{8^2-1}+\ldots+\frac{x+3}{100^2-1}=\frac{49}{101}$$

A) *2*
B) *−3*
C) $-\dfrac{1}{3}$
D) *0*

53. $\left|2^{4x^2-1}-5\right|=3$ tenglama nechta haqiqiy ildizga ega?

A) *4*
B) *3*
C) *1*
D) *2*

Tengsizliklar

1. $\left|\frac{5}{2x-6}\right|>\frac{7}{9}$ tengsizlikni yeching.

A) $(-\frac{3}{14};\ 0)\cup(0;\ 6\frac{3}{14})$
B) $(-\infty;\ -\frac{3}{14})\cup(6\frac{3}{14};\ +\infty)$
C) $(-\frac{3}{14};\ 3)\cup(3;\ 6\frac{3}{14})$
D) $(-\frac{3}{14};\ 6\frac{3}{14})$

2. $(x+3)(x+7)<10(x+7)$ tengsizlikni yeching.

A) $(-\infty;\ 7)$ B) $(-7;\ 7)$
C) $(-\infty;\ -7)$ D) $(-7;\ \infty)$

3. $2x^2+(p-10)x+6=0$ tenglamaning ildizlari nisbati 12 ga teng bo'lsa, p ning qiymatlari yig'indisini (agar u bitta bo'lsa, faqat o'zini) toping.

A) *20* B) *3*
C) *−3* D) *23*

4. $x^2-3x\le-|x|$ tengsizlikning butun yechimlari yig'indisini toping.

A) *6*
B) *1*
C) *3*
D) *4*

5. Tengsizlikni yeching:

$$\frac{(1-x)(x-4)}{(x+5)}\ge 0$$

A) $(-5;\ 1)\cup(4;\ +\infty)$
B) $(-\infty;\ -5]\cup[1;\ 4]$
C) $(-5;\ 1]\cup[4;\ +\infty)$
D) $(-\infty;\ -5)\cup[1;\ 4]$

6. Tengsizlikni yeching:

$$\frac{x-4}{(2x-5)(3x-1)} \geq 0$$

A) $\left(\frac{1}{3}; 2,5\right] \cup [4; +\infty)$

B) $\left(-\infty; \frac{1}{3}\right) \cup (2,5; 4]$

C) $\left(\frac{1}{3}; 2,5\right) \cup [4; +\infty)$

D) $\left(-\infty; \frac{1}{3}\right) \cup [2,5; 4]$

7. Tengsizlikni yeching:

$$\frac{(0,7+x)(10-x)}{2x+5} < 0$$

A) $(-2,5; -0,7] \cup [10; +\infty)$

B) $(-\infty; -2,5) \cup (-0,7; 10)$

C) $(-2,5; -0,7) \cup (10; +\infty)$

D) $(-\infty; -2,5) \cup [-0,7; 10]$

8. Tengsizlikni yeching:

$$13 + \frac{13}{2-x} \geq 0$$

A) $(-\infty; -2) \cup [13; +\infty)$

B) $(-\infty; 2) \cup (13; +\infty)$

C) $(-\infty; 2) \cup (3; +\infty)$

D) $(-\infty; 2) \cup [3; +\infty)$

9. Tengsizlikni yeching:

$$\frac{(x-5)(x-3)}{x-4} \leq 0$$

A) $(-\infty; 3] \cup (4; 5]$

B) $(-\infty; 3) \cup (4; 5)$

C) $(-\infty; 3] \cup [4; 5)$

D) $(-\infty; 3] \cup [4; 5]$

10. $\sqrt{4+3x-x^2} > -2$ tengsizlikni yeching.

A) $[-1; 4]$

B) $(-1; 4)$

C) $(-1; 4]$

D) $\{-1\} \cup \{4\}$

11. $\sqrt{4+3x-x^2} > -2$ tengsizlikni qanoatlantiradigan butun ildizlari yig'indisini toping.

A) 10 B) 11

C) 9 D) 8

12. $\frac{(2x-x^2-4)(x-4)}{x^2-16} < 0$ tengsizlikni yeching.

A) $(-4; 2)$

B) $(-\infty; 4)$

C) $(-4; 4) \cup (4; \infty)$

D) $(2; \infty)$

13. Nechta butun son
$\sqrt[4]{2x^2+7} - \sqrt{x-2} \geq 0$
tengsizlikning yechimiga tegishli?
A) *0*
B) *4*
C) *cheksiz ko'p*
D) *3*

14. $\dfrac{x-4}{\sqrt{11x+21-2x^2}} \leq 0$
tengsizlikning barcha butun yechimlari yig'indisini toping.
A) *9*
B) *15*
C) *5*
D) *6*

15. $(x+1)\cdot(|x|-1) \geq 3$ tengsizlikni yeching.
A) $(-\infty; -2]$
B) $(-\infty; -2] \cup [2; +\infty)$
C) $(-\infty; 0] \cup [2; +\infty)$
D) $[2; +\infty)$

16. $x^2 \cdot |x-1| + x^2 - 2x + 1 \leq 0$
tengsizlik nechta butun yechimga ega?
A) *1*
B) *2*
C) *cheksiz ko'p*
D) *0*

17. Tengsizlikni yeching:
$\dfrac{x}{x-3} - \dfrac{1}{x} \leq 0$
A) $(-\infty; 0)$
B) $(0; 3)$
C) $(3; +\infty)$
D) $(0; 4)$

18. $\dfrac{x^3}{x-1} \leq \dfrac{9x}{x-1}$ tengsizlikning
butun yechimlari sonini toping.
A) *5*
B) *7*
C) *4*
D) *6*

19. $x(x+6)^2 \geq 4x^2$ tengsizlikning
$(1; 6)$ oraliqdagi butun
yechimlari yig'indisini toping.
A) *15*
B) *14*
C) *20*
D) *21*

20. $\begin{cases} 5x > x^2 \\ x^2 \leq 40 \end{cases}$ tengsizliklar
sistemasining butun yechimlari
yig'indisini toping.
A) *7*
B) *12*
C) *10*
D) *9*

21. Nechta butun son $x^8 < 9x$ tengsizlikni qanoatlantiradi?

A) *1*
B) *0*
C) *aniqlab bo'lmaydi*
D) *2*

22. $\left(\sqrt{2x-1}+3\right)\cdot\left(\sqrt{2x-1}-3\right)\le 7$ tengsizlikni nechta butun son qanoatlantiradi?

A) *12*
B) *6*
C) *cheksiz ko'p*
D) *8*

23. Tengsizlikni yeching:

$$\frac{x^2-5x+6}{x-2}\le 0$$

A) $(-\infty; 3]$
B) $[2; 3]$
C) $(-\infty; 2)\cup(2; 3]$
D) $(-\infty; 2)\cup(2; 3)$

24. Tengsizlikni yeching:

$|x|^2 \le 2x^2 - 5|x| + 6$

A) $(-\infty; -3]\cup[-2; 2]\cup[3; +\infty)$
B) $[-3; -2]\cup[2; 3]$
C) $(-3; -2)\cup(2; 3)$
D) $(-\infty; -3)\cup(-2; 2)\cup(3; +\infty)$

25. Tengsizlikni yeching:

$|x|^2 \le 2x^2 - 3|x| + 2$

A) $(-\infty; -2)\cup(-1; 1)\cup(2; +\infty)$
B) $(-\infty; -2]\cup[-1; 1]\cup[2; +\infty)$
C) $(-\infty; -2]\cup[2; +\infty)$
D) $(-\infty; -2)\cup(2; +\infty)$

26. Tengsizliklar sistemasini yeching:

$$\begin{cases}\dfrac{x+3}{2-x}\le 0\\ x>-2\end{cases}$$

A) $(2; +\infty)$
B) $(-\infty; -3]\cup(2; +\infty)$
C) $[-3; -2)\cup(2; +\infty)$
D) $(-2; +\infty)$

Funksiyalar

1. Agar $f(x) = \frac{2}{x}$ bo'lsa, u holda $y = f(1 - x) - 2$ funksiyani toping.

A) $y = \frac{2x}{1-x}$ B) $y = \frac{x}{1-x}$

C) $y = \frac{x}{x-1}$ D) $y = \frac{2x}{x-1}$

2. $f(x) = 5x + b$ funksiya b ning qanday qiymat(lar)ida juft funksiya bo'ladi?

A) $b > 0$

B) $b = 2n,\ n \in N$

C) *b ning hech qanday qiymatida*

D) $b < 0$

3. $f(x) = (k - 5)x + 4$ funksiya k ning qanday qiymat(lar)ida juft funksiya bo'ladi?

A) $k = 5$ B) $k < 5$

C) $k > 5$ D) $k = 2n,\ n \in N$

4. $f(x) = (2k - 10)\ x + 41$ funksiya k ning qanday qiymatlarida qat'iy kamayuvchi bo'ladi?

A) $k > 5$

B) $k < 5$

C) $k = 2n,\ n \in N$

D) $k \in R$

5. $f(x) = (k + 4)\ x + 4$ funksiya k ning qanday qiymatlarida qat'iy o'suvchi bo'ladi?

A) $k \in R$

B) $k > -4$

C) $k < 0$

D) $k < -4$

6. Agar $f(x) = kx + 3$ funksiya uchun $f(1) = 1$ munosabat o'rinli bo'lsa, $f(-1)$ ni toping.

A) -1 B) 5

C) 6 D) -2

7. Agar $f(x) = kx + 3$ funksiya uchun $f(2) = -3$ munosabat o'rinli bo'lsa, $f(-3)$ ni toping.

A) 2

B) 6

C) 12

D) 9

8. Koordinata o'qlarining (2; 0) va (0; 5) nuqtalaridan o'tadigan chiziqli funksiyani toping.

A) $y = 2{,}5x + 5$

B) $y = -2{,}5x + 5$

C) $y = -2{,}5x - 5$

D) $y = 2{,}5x - 5$

9. $f(x)=\sqrt{\frac{3}{5-x}}$ funksiyaning aniqlanish sohasiga tegishli natural sonlar nechta?

A) *2* B) *5*
C) *4* D) *3*

10. x ning qanday qiymatida $f(x)=\sqrt{\frac{3}{5-x}}$ funksiyaning qiymati 1 ga teng bo'ladi?

A) *2*
B) *1*
C) *3*
D) *4*

11. Agar $f(x)=x^2-3$ funksiyaning eng kichik qiymati a bo'lsa, $f(a)$ ni toping.

A) *3*
B) *6*
C) *0*
D) *-3*

12. $f(x)=x^2+bx+c$ funksiyaning nollari -2 va 3 bo'lsa, c ni toping.

A) *1*
B) *−6*
C) *6*
D) *−1*

13. $f(x)=x^2-3x+c$ funksiyaning nollaridan biri 1 bo'lsa, c ni toping.

A) *3*
B) *-4*
C) *2*
D) *-2*

14. $f(x)=x^2+bx+4$ funksiyaning nollaridan biri 1 bo'lsa, ikkinchisini toping.

A) *-4*
B) *5*
C) *-5*
D) *4*

15. $f(x)=(x+1)^2+2$ parabola uchining koordinatalarini toping.

A) *(-1; 2)*
B) *(-1; -2)*
C) *(1; 2)*
D) *(1; -2)*

16. $f(x)=\sqrt{\frac{3}{6-x}}$ funksiyaning aniqlanish sohasiga tegishli natural sonlar nechta?

A) *6*
B) *5*
C) *4*
D) *3*

17. $f(x) = \frac{4x}{x+2}$ funksiyaning aniqlanish sohasini toping.

A) $(-\infty; 0]$
B) $(-\infty; -2)$
C) $(-\infty; -2) \cup [0; \infty)$
D) $(-\infty; -2) \cup (-2; \infty)$

18. $f(x) = \frac{4}{x} - 2$ funksiyaning qiymatlar sohasini toping.

A) $(-2; \infty)$
B) $(-\infty; -2) \cup (-2; \infty)$
C) $(-\infty; 2) \cup (2; \infty)$
D) $(-\infty; 0) \cup (0; \infty)$

19. k ning qanday qiymatida $y = kx^2 - 3$ funksiyaning grafigi $A(-2; 9)$ nuqtadan o'tadi?

A) -3 B) -6
C) 3 D) 6

20. x ning qanday qiymatida $y = \frac{2}{3}x - 3$ funksiyaning qiymati $\frac{5}{9}$ ga teng bo'ladi?

A) $-1\frac{1}{3}$ B) $4\frac{2}{3}$
C) $5\frac{1}{3}$ D) $2\frac{1}{3}$

21. Agar $f(x) = 3x^3 + 2x^2 - 25x + 2$ bo'lsa, $f(0)$ ning qiymatini toping.

A) 4 B) 1
C) 3 D) 2

22. x ning qanday qiymatida $y = \frac{3}{4}x - 2$ funksiyaning qiymati $\frac{5}{8}$ ga teng bo'ladi?

A) $2\frac{2}{3}$ B) $2\frac{1}{2}$
C) $1\frac{1}{3}$ D) $3\frac{1}{2}$

23. Agar $\sqrt{5}$ son $y = -2x^2 + bx + 5$ funksiyaning noli bo'lsa, b ni toping.

A) $\sqrt{5}$
B) $\sqrt{2}$
C) $\sqrt{3}$
D) 1

24. $y = \sqrt{|x^2 - 4| \cdot (x - 3)}$ funksiyaning aniqlanish sohasini toping.

A) $(3; +\infty)$
B) $\{\pm 2\} \cup [3; +\infty)$
C) $[-2; 2] \cup [-3; +\infty)$
D) $(-\infty; -2] \cup [2; 3]$

25. $f(x) = 13x^5 + 6x^3 - 27$ funksiya berilgan bo'lsa, $f(x^3 - 27x)$ funksiyaning darajasini toping.

A) *9* B) *8*
C) *15* D) *5*

26. Abssissalar o'qiga nisbatan $y = -4x + 15$ chiziqli funksiyaga simmetrik bo'lgan funksiyani toping.

A) $y = 4x + 15$
B) $y = -4x - 15$
C) $y = -4x + 15$
D) $y = 4x - 15$

27. $x = 1$ to'g'ri chiziqqa nisbatan $y = -4x + 15$ chiziqli funksiyaga simmetrik bo'lgan funksiyani toping.

A) $y = -4x - 7$
B) $y = -4x + 9$
C) $y = 4x - 9$
D) $y = 4x + 7$

28. $y = 1$ to'g'ri chiziqqa nisbatan $y = -4x + 15$ chiziqli funksiyaga simmetrik bo'lgan funksiyani toping.

A) $y = 4x - 13$
B) $y = 4x + 7$
C) $y = -4x - 15$
D) $y = -4x + 9$

29. $y = 4x^2 - 24x - 21$ kvadrat funksiyaning simmetriya o'qi bo'lgan to'g'ri chiziq tenglamasini aniqlang.

A) $x = 4$
B) $x = 3$
C) $x = 0$
D) $x = 1$

30. $y = 2x^2 - 8x + 11$ parabola uchining koordinatalari ko'paytmasini toping.

A) *10* B) *6*
C) *12* D) *8*

31. $y = ax^2 + bx + c$ kvadrat funksiyaning grafigi faqat I, II va III choraklarda yotsa, a, b, c larning har birini nol bilan taqqoslang.

A) $a > 0,\ b > 0,\ c \geq 0$
B) $a > 0,\ b < 0,\ c \leq 0$
C) $a < 0,\ b > 0,\ c \geq 0$
D) $a < 0,\ b < 0,\ c \geq 0$

32. $y = x^2 - 6x + 7$ kvadrat funksiyaning abssissa o'qiga nisbatan simmetrik funksiyasini aniqlang.

A) $y = x^2 + 6x + 7$
B) $y = -x^2 + 6x - 7$
C) $y = -x^2 - 6x - 7$
D) $y = x^2 - 6x + 7$

33. $y = x^2 - 6x + 3$ kvadrat funksiyaning $(0; 0)$ nuqtaga nisbatan simmetrik funksiyasini aniqlang.

A) $y = -x^2 + 6x - 3$
B) $y = x^2 - 6x + 3$
C) $y = -x^2 - 6x - 3$
D) $y = x^2 + 6x + 3$

34. $y = x^2 - 4x + 5$ kvadrat funksiyaning $x = 1$ chiziqqa nisbatan simmetrik funksiyasini aniqlang.

A) $y = x^2 - 2x + 2$
B) $y = x^2 - 4x + 5$
C) $y = x^2 + 2x + 2$
D) $y = x^2 + 1$

35. b^2 ning qanday qiymatlarida $f(x) = x^2 + bx + 1$ funksiya abssissalar o'qini ikkita nuqtada kesib o'tadi?

A) $b^2 = 4$
B) $b^2 < 4$
C) $b^2 > 0$
D) $b^2 > 4$

36. $\begin{cases} x = 2t + 1 \\ y = 3t - 1 \end{cases}$ bo'lsa, y ni x orqali ifodalang.

A) $y = \frac{3x}{2} + \frac{5}{2}$
B) $y = \frac{3x}{2} - \frac{5}{2}$
C) $y = \frac{2x}{3} + \frac{5}{3}$
D) $y = \frac{2x}{3} - \frac{5}{3}$

37. $f(x) = 2x - 5$ va $f(g(x)) = \frac{2x+3}{x-5}$ bo'lsa, $g(2)$ ning qiymatini toping.

A) $-\frac{4}{3}$ B) $-\frac{7}{3}$
C) $\frac{4}{3}$ D) $\frac{7}{3}$

38. $f(x) = 2x - 5$ va $f(g(x)) = \frac{2x+3}{x-5}$ bo'lsa, $g(-3)$ ning qiymatini toping.

A) $\frac{43}{16}$
B) $-\frac{3}{8}$
C) $-\frac{43}{16}$
D) $\frac{3}{8}$

39. $y = 6x^2 - 4x - 2$ kvadrat funksiyaning o'sish oralig'ini toping.

A) $\left[\frac{1}{3}; +\infty\right)$ B) $\left[-\frac{1}{3}; +\infty\right)$

C) $\left[-\frac{1}{3}; 1\right]$ D) $[1; +\infty)$

40. $y = \frac{\sqrt{2x + 24 - x^2}}{7^{(x+2)^2-4} - 1}$ funksiyaning aniqlanish sohasiga nechta butun son tegishli?

A) *8* B) *11*

C) *10* D) *9*

41. Agar $f(x)$ funksiya $(-\infty; +\infty)$ da qat'iy o'suvchi funksiya bo'lsa, $y = 3f(x) - 8$ funksiya uchun quyidagi mulohazalardan qaysi biri doim to'g'ri bo'ladi?

A) *qat'iy o'suvchi*

B) *dastlab kamayadi, keyin o'sadi*

C) *qat'iy kamayuvchi*

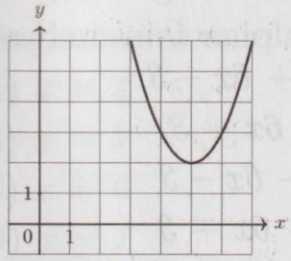
D) *dastlab o'sadi, keyin kamayadi*

42. Agar $f\left(\frac{2x-1}{3}\right) = \frac{6x+5}{3}$ bo'lsa, $f(1) - f(-2)$ ni hisoblang.

A) *3* B) *9*

C) *-12* D) *-3*

43. Rasmda qaysi kvadrat funksiyaning grafigi tasvirlangan?



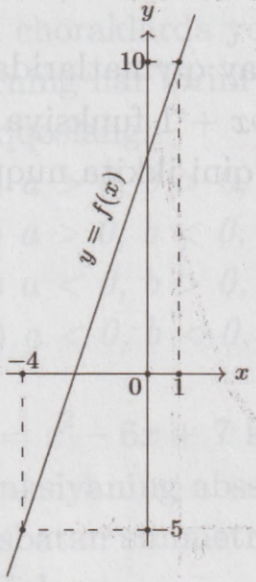
A) $y = x^2 - 10x + 27$

B) $y = x^2 - 10x + 23$

C) $y = x^2 + 10x + 23$

D) $y = x^2 - 10x + 21$

44. Rasmda $f(x) = kx + b$ funksiyaning grafigi tasvirlangan. $f(2) + f(0)$ ning qiymatini toping.



A) *20*

B) *24*

C) *18*

D) *16*

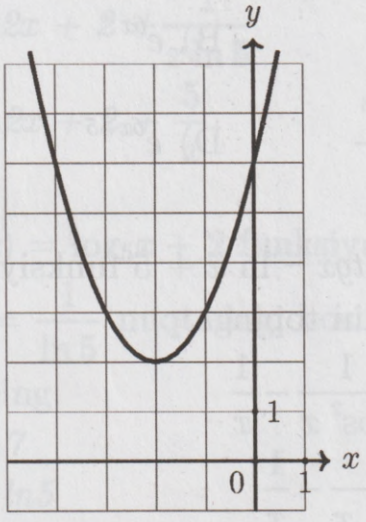
45. $y = \dfrac{\sqrt{2x+24-x^2}}{3^{(x+1)^2-9}-1}$ funksiyaning aniqlanish sohasiga tegishli tub sonlarning yig'indisini toping.

A) *9* B) *8*
C) *14* D) *10*

46. $y = \dfrac{\sqrt{10x-16-x^2}}{8^{(x+2)^2-16}-1}$ funksiyaning aniqlanish sohasiga tegishli eng katta va eng kichik butun sonlarning ko'paytmasini toping.

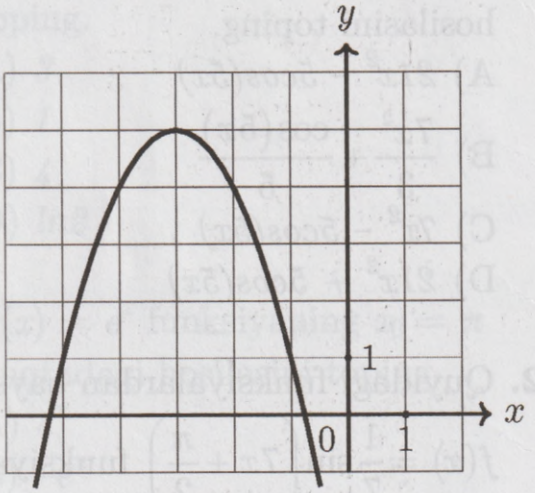
A) *24* B) *16*
C) *14* D) *21*

47. Rasmda qaysi kvadrat funksiyaning grafigi tasvirlangan?



A) $y = x^2 - 4x + 10$
B) $y = x^2 + 4x + 10$
C) $y = x^2 + 4x + 6$
D) $y = x^2 + 8x + 2$

48. Rasmda qaysi kvadrat funksiyaning grafigi tasvirlangan?



A) $y = -x^2 - 6x - 8$
B) $y = -x^2 + 6x - 6$
C) $y = -x^2 - 6x - 6$
D) $y = -x^2 - 6x - 4$

Hosila va uning tadbiqlari

1. $f(x) = 7x^3 + \sin(5x)$ funksiyaning hosilasini toping.

A) $21x^2 - 5\cos(5x)$

B) $\frac{7x^2}{3} + \frac{\cos(5x)}{5}$

C) $7x^2 - 5\cos(5x)$

D) $21x^2 + 5\cos(5x)$

2. Quyidagi funksiyalardan qaysi biri $f(x) = \frac{1}{7}\sin\left(7x + \frac{\pi}{2}\right)$ funksiyaning hosilasi bo'ladi?

A) $\frac{1}{49}\cos\left(7x + \frac{\pi}{2}\right)$

B) $-\cos\left(7x + \frac{\pi}{2}\right)$

C) $\cos\left(7x + \frac{\pi}{2}\right)$

D) $\cos(7x)$

3. Quyidagi funksiyalardan qaysi biri $f(x) = \frac{1}{3}e^{3x+5} + \cos\left(3x - \frac{\pi}{4}\right)$ funksiyaning hosilasiga teng bo'ladi?

A) $e^{3x+5} + 3\sin\left(3x - \frac{\pi}{4}\right)$

B) $e^{3x} - 3\sin(3x)$

C) $e^{3x+5} - 3\sin\left(3x - \frac{\pi}{4}\right)$

D) $\frac{e^{3x+5}}{9} - \frac{\sin\left(3x - \frac{\pi}{4}\right)}{3}$

4. $f(x) = \frac{1}{6}e^{6x+5}$ funksiyaning hosilasini toping.

A) $\frac{e^{6x}}{6}$ B) e^{6x}

C) $\frac{e^{6x+5}}{6}$ D) e^{6x+5}

5. $f(x) = tgx - \ln x + 5$ funksiyaning hosilasini toping.

A) $-\frac{1}{\cos^2 x} - \frac{1}{x}$

B) $\frac{1}{\sin^2 x} - \frac{1}{x}$

C) $\frac{1}{\cos^2 x} - \frac{1}{x}$

D) $-\frac{1}{\sin^2 x} - \frac{1}{x}$

6. $f(x) = \sin x + \cos x + \pi$ funksiyaning hosilasini toping.
A) $\sin x - \cos x$
B) $-\sin x - \cos x$
C) $-\sin x + \cos x$
D) $\sin x + \cos x$

7. $f(x) = 2\sin x + 2\cos x + 2\pi$ funksiyaning hosilasini toping.
A) $-2\sin x + 2\cos x$
B) $-2\sin x - 2\cos x$
C) $2\sin x + 2\cos x$
D) $2\sin x - 2\cos x$

8. $f(x) = x^2 + 2x + 4 + \log_5 x$ funksiyaning hosilasini toping.
A) $2x + 2 + 5^x \ln 5$
B) $2x + 2 + 5 \cdot 5^x$
C) $2x + 2 + \dfrac{1}{x \ln 5}$
D) $2x + 2 + \dfrac{5}{x}$

9. $f(x) = \log_5 x + 2$ funksiyaning $x_0 = \dfrac{1}{\ln 5}$ nuqtadagi hosilasini toping.
A) 7
B) $\ln 5$
C) 1
D) 3

10. $f(x) = \log_3 x + 2$ funksiyaning $x_0 = \dfrac{1}{\ln 3}$ nuqtadagi hosilasini toping.
A) 3
B) 1
C) 4
D) $\ln 2$

11. $f(x) = e^x$ funksiyaning $x_0 = \pi$ nuqtadagi hosilasini toping.
A) e^π
B) $-e^\pi$
C) $\ln \pi$
D) $-\ln \pi$

12. $f(x) = 1 + \operatorname{ctg} x$ funksiyaning $x_0 = \dfrac{\pi}{2}$ hosilasini toping.
A) -1
B) 1
C) 0
D) 2

13. $f(x) = 4\sqrt{x+1}$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.
A) 4
B) $\dfrac{2}{3}$
C) $\dfrac{1}{2}$
D) 2

14. $f(x) = -4\sqrt[3]{x-1}$ funksiyaning $x_0 = 2$ nuqtadagi hosilasini toping.

A) -4 B) $\frac{1}{3}$

C) $-\frac{4}{3}$ D) $\frac{4}{3}$

15. $f(x) = -\frac{x}{2} + \sqrt{x}$ funksiyaning $x_0 = 1$ nuqtadagi hosilasini toping.

A) 0

B) 1

C) $\frac{1}{2}$

D) $-\frac{1}{4}$

16. $f(x) = \cos x$ funksiyaning $x_0 = \pi$ nuqtadagi hosilasini toping.

A) $\frac{\sqrt{2}}{2}$ B) 0

C) -1 D) 1

17. $f(x) = \operatorname{tg} x$ funksiyaning $x_0 = \pi$ nuqtadagi hosilasini toping.

A) 0

B) 1

C) 2

D) $\frac{2}{3}$

18. $f(x) = \frac{2x+1}{3x-1}$ funksiyaning $x_0 = 1$ nuqtadagi hosilasini toping.

A) $-\frac{5}{4}$ B) $-\frac{5}{16}$

C) 1 D) -5

19. $f(x) = e^x + x^3$ funksiyaning $x_0 = -1$ nuqtadagi hosilasini toping.

A) $e^{-1} - 3$

B) $e^{-1} + 3$

C) 1

D) $e^{-1} - 1$

20. $f(x) = 4\sqrt[4]{x}$ funksiyaning hosilasini toping.

A) $x^{-\frac{1}{4}}$ B) $x^{\frac{3}{4}}$

C) $x^{-\frac{3}{4}}$ D) $x^{\frac{1}{4}}$

21. $f(x) = \sqrt{x} + x^3$ funksiyaning hosilasini toping.

A) $-\frac{1}{\sqrt{x}} + 3x^2$

B) $\frac{1}{\sqrt{x}} + 3x^2$

C) $\frac{1}{2\sqrt{x}} + 3x^2$

D) $\frac{1}{2\sqrt{x}} - 3x^2$

22. $f(x) = \frac{x^2}{2} - \sin x$ funksiyaning hosilasini toping.

A) $x + \cos x$
B) $-x - \cos x$
C) $-x + \cos x$
D) $x - \cos x$

23. $f(x) = x^4 - x^3$ funksiyaning hosilasini toping.

A) $-4x^3 - 3x^2$
B) $-4x^3 + 3x^2$
C) $4x^3 + 3x^2$
D) $4x^3 - 3x^2$

24. $f(x) = \frac{x^4}{2} - \frac{x^3}{6}$ funksiyaning hosilasini toping.

A) $-2x^3 + \frac{x^2}{2}$
B) $2x^3 - \frac{x^2}{2}$
C) $-2x^3 - \frac{x^2}{2}$
D) $2x^3 + \frac{x^2}{2}$

25. Agar $f(x) = x^5$ bo'lsa, $f'(1)$ ni toping.

A) 5 B) -5
C) $\frac{1}{5}$ D) $-\frac{1}{5}$

26. $f(x) = x\cos x^2$ funksiyaning $x_0 = \sqrt{\pi}$ nuqtadagi hosilasini toping.

A) 0 B) -1
C) 2π D) 1

27. $f(x) = \frac{1}{\sin^2(2x + \pi)}$ funksiyaning $x_0 = \frac{\pi}{8}$ nuqtadagi hosilasini toping.

A) 8 B) -4
C) -8 D) 4

28. $f(x) = \ln\sqrt{x^2 + 4x + 5} + 2x$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.

A) $2\frac{2}{5}$
B) $4\frac{2}{5}$
C) $2\frac{3}{5}$
D) $3\frac{2}{5}$

29. $f(x) = (x^2 + 2x)\cdot\sqrt{x + 4}$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.

A) -2
B) 4
C) 2
D) 0

30. $f(x) = (x^2 + 3x - 2)\cdot\sqrt{x^2+1}$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.

A) *-3*
B) *1*
C) *-1*
D) *3*

31. $f(x) = (2x-1)^{20}\cdot(\cos x + \sin x)$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.

A) *-39*
B) *-40*
C) *39*
D) *40*

32. $f(x) = \dfrac{x\cdot 3^x}{\ln 3} - \dfrac{3^x}{\ln^2 3} + 2x$ funksiyaning $x_0 = 1$ nuqtadagi hosilasini toping.

A) *-4*
B) *5*
C) *4*
D) *-5*

33. $f(x) = \dfrac{x\cdot 4^x}{\ln 4} - \dfrac{4^x}{\ln^2 4} - 2x$ funksiyaning $x_0 = 1$ nuqtadagi hosilasini toping.

A) *-4*
B) *5*
C) *4*
D) *-5*

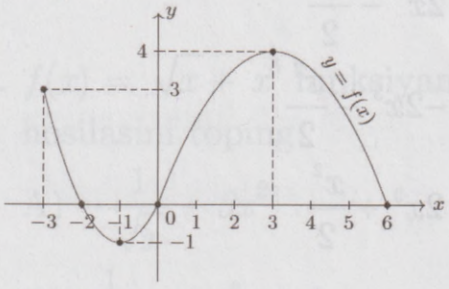
34. $f(x) = \dfrac{x^4\cdot \ln 3x}{4} - \dfrac{x^4}{16} + 2$ funksiyaning $x_0 = 1$ nuqtadagi hosilasini toping.

A) *ln3*
B) *-ln9*
C) *-ln3*
D) *ln9*

35. $f(x) = \dfrac{15}{4x^2} + \dfrac{12x^2}{5}$ funksiyaning eng kichik qiymatini toping.

A) *7*
B) *6*
C) *8*
D) *5*

36. Rasmda $y = f(x)$ funksiyaning grafigi tasvirlangan. Quyidagi tengsizliklardan qaysi biri to'g'ri?



A) $f'(-2)\cdot f(-1) > 0$
B) $f'(4)\cdot f(-3) > 0$
C) $f'(5)\cdot f(5) > 0$
D) $f'(4)\cdot f(1) > 0$

37. $f(x) = (x^2 - x + 2)\cdot(x - 2)$ funksiyaning $x_0 = 2$ nuqtadagi hosilasini toping.

A) *2* B) *4*
C) *3* D) *1*

38. $f(x) = \ln x^x$ funksiyaning hosilasini toping.

A) $f'(x) = lnx - \frac{1}{x} + 1$
B) $f'(x) = lnx$
C) $f'(x) = lnx + 1$
D) $f'(x) = lnx + \frac{1}{x} + 1$

39. $g(x) = x^2\cdot f(x)$ funksiya berilgan. Agar $f'(2) = f(2) \neq 0$ bo'lsa, $\frac{g'(2)}{f'(2)}$ ning qiymatini toping.

A) *6* B) *8*
C) *12* D) *10*

40. $g(x) = (f(x))^{98}$ funksiya berilgan. Agar $f'(2) \neq 0$ va $f(2) = -1$ bo'lsa, $\frac{g'(2)}{f'(2)}$ ning qiymatini toping.

A) *99*
B) *1*
C) *97*
D) *-98*

41. $f(x) = e^{-3x+2}\cdot\sin(-3x)$ funksiyaning hosilasini toping.

A) $3e^{-3x+2}\cdot(cos3x - sin3x)$
B) $-3e^{-3x+2}\cdot(cos3x + sin3x)$
C) $-3e^{-3x+2}\cdot(cos3x - sin3x)$
D) $3e^{-3x+2}\cdot(cos3x + sin3x)$

42. $f(x) = \cos(\sin 3x - 2)$ funksiyaning $x_0 = 0$ nuqtadagi hosilasini toping.

A) *-3sin2*
B) *3sin2*
C) *0*
D) *3cos2*

43. $f(2x + 1) = x^4 + 4x^2 - 2x$ funksiya berilgan. $f'(3)$ ni toping.

A) *0* B) *6*
C) *10* D) *5*

44. Agar $f(x)$ funksiya uchun $c + x\cdot f(x) = (x - 2)\cdot(2x - 1)^{10}$ munosabat o'rinli bo'lsa, $f'(1)$ ni toping (c – o'zgarmas son).

A) *-22* B) *-20*
C) *-19* D) *-18*

45. Agar $a = 16 - x^2$, $b = x^2 - 4$ va $a, b \in N$ bo'lsa, ab ning eng katta qiymatini toping.

A) *24* B) *35*
C) *36* D) *16*

46. Agar a, b, c musbat haqiqiy sonlar uchun $ab = 5$ va $bc = 8$ bo'lsa, $5a + b + 3c$ ning eng kichik qiymatini toping.

A) *20*
B) *16*
C) *50*
D) *14*

47. $y = x + \dfrac{4}{x-3}$ funksiyaning $(3; \infty)$ oraliqdagi eng kichik qiymatini toping.

A) *6*
B) *4*
C) *7*
D) *8*

48. Agar $a = 13 - x^2$, $b = x^2 - 3$ va $a, b \in N$ bo'lsa, ab ning eng katta qiymatini toping.

A) *16*
B) *25*
C) *24*
D) *9*

Integral va uning tadbiqlari

1. $y = \sqrt{x}$, $y = \sqrt{3-2x}$, $y = 0$ chiziqlar bilan chegaralangan soha yuzini toping.

A) *2,5* B) *0*
C) *1* D) *1,5*

2. $\int\limits_0^2 \left(\dfrac{x^3+1}{x^2-x+1} + 2x \right) dx$ aniq integralni hisoblang.

A) *8* B) *9*
C) *7* D) *6*

3. $\int \dfrac{1}{\cos^2(3x-4)} dx$ integralni hisoblang.

A) $\dfrac{tg(3x-4)}{4} + C$

B) $-\dfrac{tg(3x-4)}{4} + C$

C) $-\dfrac{tg(3x-4)}{3} + C$

D) $\dfrac{tg(3x-4)}{3} + C$

4. $\int \frac{1}{\sin^2(4x-3)}dx$ integralni hisoblang.

A) $\frac{ctg(3-4x)}{4}+C$

B) $\frac{ctg(3-4x)}{3}+C$

C) $-\frac{ctg(3-4x)}{4}+C$

D) $-\frac{ctg(3-4x)}{3}+C$

5. $\int(2x+3)\cos(x^2+3x)dx$ integralni hisoblang.

A) $-sin(x^2+3x)+C$

B) $-cos(x^2+3x)+C$

C) $sin(x^2+3x)+C$

D) $cos(x^2+3x)+C$

6. $\int \cos x \cdot \sin^7 x dx$ integralni hisoblang.

A) $-\frac{1}{8}sin^8x+C$

B) $-\frac{1}{8}cos^8x+C$

C) $\frac{1}{8}sin^8x+C$

D) $\frac{1}{8}cos^8x+C$

7. $\int \frac{\cos\sqrt{x}}{\sqrt{x}}dx$ integralni hisoblang.

A) $-\frac{1}{2}sin\sqrt{x}+C$

B) $2sin\sqrt{x}+C$

C) $-2sin\sqrt{x}+C$

D) $\frac{1}{2}sin\sqrt{x}+C$

8. $\int 4x \cdot \ln 2x dx$ integralni hisoblang.

A) $x^2 \cdot ln2x - 2x^2 + C$

B) $4x^2 \cdot ln2x - 2x^2 + C$

C) $2x^2 \cdot ln2x - 2x^2 + C$

D) $2x^2 \cdot ln2x - x^2 + C$

9. $\int x^3 \cdot \ln 3x dx$ integralni hisoblang.

A) $\frac{x^4 \cdot \ln 3x}{4}+\frac{x^4}{16}+C$

B) $\frac{x^4}{4}-\frac{x^4 \cdot \ln 3x}{16}+C$

C) $\frac{x^4}{4}+\frac{x^4 \cdot \ln 3x}{16}+C$

D) $\frac{x^4 \cdot \ln 3x}{4}-\frac{x^4}{16}+C$

10. $f(x) = (\sin x - \cos x)^2$ funksiyaning boshlang'ich funksiyasini toping.

A) $F(x) = x - \frac{1}{2}\cos 2x + C$

B) $F(x) = x + \frac{1}{2}\cos 2x + C$

C) $F(x) = -x + \frac{1}{2}\cos 2x + C$

D) $F(x) = -x - \frac{1}{2}\cos 2x + C$

11. $f(x) = x^2 - x + 2$ funksiyaning (0; 2) nuqtadan o'tuvchi boshlang'ich funksiyasini toping.

A) $F(x) = 2x - \frac{1}{2}x^2 + \frac{1}{3}x^3 + 1$

B) $F(x) = 2x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - 2$

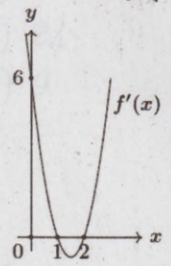
C) $F(x) = 2x - \frac{1}{2}x^2 + \frac{1}{3}x^3 + 2$

D) $F(x) = 2x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - 1$

12. $F(x)$ funksiya $f(x) = 3x^2 - 2x + 1$ funksiyaning boshlang'ich funksiyasi. $F(x)$ funksiyaning [0; 2] kesmadagi eng kichik qiymati 2 ga teng bo'lsa, $F(x)$ ning [0; 2] kesmadagi eng katta qimatini toping.

A) 6 B) 8
C) 7 D) 9

13. Rasmda $f'(x)$ kvadrat funksiyaning grafigi tasvirlangan. Uning $f(x)$ boshlang'ich funksiyasi uchun $f(0) = 1$ bo'lsa, u holda $f(2)$ ni hisoblang.



A) 0 B) 1
C) 3 D) 2

14. Aniq integralni hisoblang:

$$\int_0^1 \frac{dx}{\sin^2(2x-3)}$$

A) $\frac{\sin 3}{2\sin 1 \cdot \sin 2}$

B) $\frac{\sin 2}{2\sin 1 \cdot \sin 3}$

C) $\frac{\sin 1}{2\sin 2 \cdot \sin 3}$

D) $\frac{\cos 2}{2\sin 1 \cdot \sin 3}$

15. Integralni hisoblang:

$$\int_{-1}^{1} \frac{(x+2)\,dx}{\sqrt{x^2+4x+7}}$$

A) $\sqrt{3} - 1$

B) $2\sqrt{3}$

C) $2\sqrt{3} - 2$

D) $2 - \sqrt{3}$

16. Integralni hisoblang:

$\int_0^1 (2x+3)\cos(x^2+3x)\,dx$

A) $sin4$ B) $-2sin4$
C) $-sin4$ D) $2sin4$

17. Integralni hisoblang:

$\int_{\frac{\pi}{2}}^{\pi} \cos x \cdot \sin^7 x dx$

A) $-\frac{1}{8}$ B) $\frac{1}{4}$
C) $\frac{1}{8}$ D) 0

18. $f(x) = (x^2 - 10)\cdot \ln x$ funksiyaning (1; 0) nuqtadan o'tuvchi boshlang'ich funksiyasi $F(x)$ bo'lsa, $F(2)$ va (3) larni taqqoslang.

A) $F(2) > F(3)$
B) $F(2) = F(3)$
C) $F(3) = F(2) + 1$
D) $F(2) < F(3)$

19. $\int \sin x \cdot \cos^7 x dx$ integralni hisoblang.

A) $\frac{1}{8}\sin^8 x + C$
B) $-\frac{1}{8}\cos^8 x + C$
C) $-\frac{1}{8}\sin^8 x + C$
D) $\frac{1}{8}\cos^8 x + C$

20. Integralni hisoblang:

$\int (5x^4 + 1)\ln 2x dx$.

A) $(x^5 - x)ln2x + \frac{x^5}{5} - x + C$
B) $(x^5 - x)ln2x - \frac{x^5}{5} + x + C$
C) $(x^5 - x)ln2x - \frac{x^5}{5} + C$
D) $(5x^4 - 1)ln2x - \frac{x^5}{5} + x + C$

21. $\int e^{\cos 4x} \cdot \sin 4x dx$ integralni hisoblang.

A) $\frac{1}{4}e^{cos4x} + C$
B) $-4e^{cos4x} + C$
C) $4e^{cos4x} + C$
D) $-\frac{1}{4}e^{cos4x} + C$

22. $x = \frac{1}{e}$, $x = e$, to'g'ri chiziqlar, Ox o'qi va $f(x) = \left|\frac{1}{x}\right|$ funksiya grafigi bilan chegaralangan egri chiziqli trapetsiyaning yuzini toping.

A) 1
B) 3
C) 0
D) 2

23. $x = 1$, $x = 4$, $y = 0$ to'g'ri chiziqlar, Ox o'qi va $y = \frac{4}{x}$ funksiya grafigi bilan chegaralangan egri chiziqli trapetsiyaning yuzini toping.

A) $16\ln 2$
B) $8\ln 4$
C) $\ln 128$
D) $4\ln 4$

24. $x = -3$, $x = 3$ to'g'ri chiziqlar, Ox o'qi va $f(x) = |x|$ funksiya grafigi bilan chegaralangan egri chiziqli trapetsiyaning yuzini toping.

A) *9*
B) *18*
C) *4,5*
D) *6*

25. $\int_0^3 \frac{3x+4}{2+3x}dx = k + \frac{2}{3}\ln\frac{11}{2}$ bo'lsa, k ni toping.

A) *4*
B) *3*
C) *2*
D) *5*

Planimetriya

1. Agar qo'shni burchaklar ayirmasi 26° bo'lsa, shu burchaklardan kattasining gradus o'lchovini aniqlang.

A) *108°*
B) *77°*
C) *103°*
D) *72°*

2. Agar ikkita to'g'ri chiziq kesishishidan hosil bo'lgan burchaklardan ikkitasining gradus o'lchovlari 2:3 nisbatda bo'lsa, burchaklarning farqini toping.

A) *18°*
B) *12°*
C) *36°*
D) *42°*

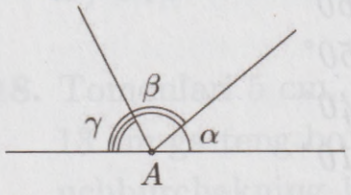
3. Ikkita to'g'ri chiziq kesishishidan hosil bo'lgan burchaklardan biri ikkinchisidan 10° ga katta bo'lsa, ularning nisbatini toping.

A) *19:17* B) *13:9*
C) *23:17* D) *11:9*

4. ABC uchburchakning burchaklari 2:3:1 kabi nisbatda. Agar eng kichik tomoni 6 cm bo'lsa, eng katta tomoni uzunligini (cm) hisoblang.

A) *12* B) $6\sqrt{2}$
C) *10* D) $6\sqrt{3}$

5. Yoyiq burchakning A nuqtasidan chiquvchi ikkita nur uni 2:4:3 nisbatdagi burchaklarga ajratadi. Eng kichik burchakni toping.

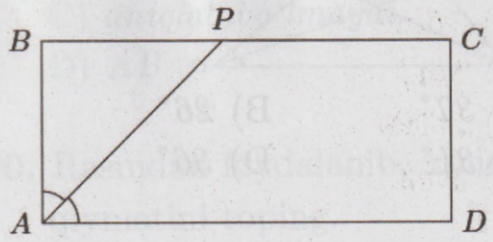


A) *60°* B) *90°*
C) *80°* D) *40°*

6. Agar ABC uchburchak uchun $AC^2 = BC^2 + AB^2 + \sqrt{3}\,AB \cdot BC$ bo'lsa, u holda $\angle ABC$ ni toping.

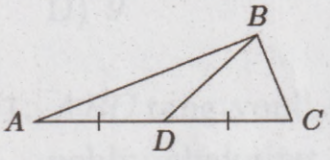
A) *30°* B) *150°*
C) *120°* D) *60°*

7. Rasmda $ABCD$ to'g'ri to'rtburchak, BAD burchakning AP bissektrisasi tasvirlangan. Agar $BP = 6$ va $PC = 7$ bo'lsa, $APCD$ trapetsiyaning yuzini toping.



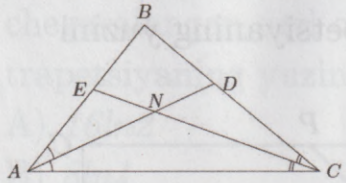
A) *60*
B) *56*
C) *52*
D) *42*

8. Rasmda ABC uchburchak va uning BD medianasi tasvirlangan. Agar $AC = 2BD$ va $\angle CAB = 23°$ bo'lsa, ACB burchakni toping.



A) *53°*
B) *57°*
C) *62°*
D) *67°*

9. Rasmda ABC uchburchak, uning AD va CE bissektrisalari tasvirlangan. Agar $\angle ABC = 106°$ bo'lsa, $\angle ENA$ burchakni toping.



A) *37°* B) *26°*
C) *34°* D) *36°*

10. ABC uchburchak tomonlarining o'rtalari tutashtirilib, $A_1B_1C_1$ uchburchak hosil qilingan. $A_1B_1C_1$ uchburchakning perimetri 50 ga teng bo'lsa, ABC uchburchakning perimetrini toping.

A) *75*
B) *50*
C) *25*
D) *100*

11. To'g'ri burchakli uchburchakning balandligi gipotenuzasini 3 va 12 ga teng kesmalarga ajratadi. Shu balandlikni toping.

A) *8*
B) *5*
C) *6*
D) *4*

12. To'g'ri burchakli uchburchakning katetlari 5 cm va $\frac{5}{\sqrt{3}}$ cm ga teng bo'lsa, eng kichik burchagini toping.

A) *15°* B) *60°*
C) *30°* D) *90°*

13. Qo'shni burchaklarning gradus o'lchovlari 2:7 nisbatda bo'lsa, shu burchaklarni toping.

A) *20°; 160°*
B) *30°; 150°*
C) *40°; 140°*
D) *70°; 110°*

14. Qo'shni burchaklarning gradus o'lchovlari 1:8 nisbatda bo'lsa, shu burchaklarni toping.

A) *20°; 160°*
B) *30°; 150°*
C) *40°; 140°*
D) *70°; 110°*

15. Uchburchak burchaklarning gradus o'lchovlari 1:2:3 nisbatlarda bo'lsa, shu uchburchakning burchaklarini toping.

A) *15°; 75°; 90°*
B) *30°; 60°; 90°*
C) *25°; 50°; 105°*
D) *35°; 35°; 90°*

16. Bir burchagi 60° ga va gipotenuzasi 16 cm ga teng bo‘lgan to‘g‘ri burchakli uchburchakning kichik katetini (cm) toping.

A) *4*
B) *16*
C) *8*
D) $8\sqrt{3}$

17. Bir burchagi 60° ga va gipotenuzasi 16 cm ga teng bo‘lgan to‘g‘ri burchakli uchburchakning katta katetini (cm) toping.

A) *16*
B) $9\sqrt{2}$
C) $9\sqrt{3}$
D) $8\sqrt{3}$

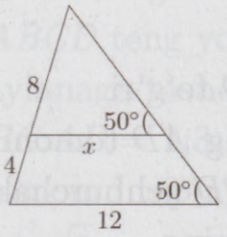
18. Tomonlari 5 cm, 12 cm va 13 cm ga teng bo‘lgan uchburchakning 13 cm li tomoniga tushurilgan balandligining uzunligini (cm) toping.

A) $\frac{8}{13}$
B) $4\frac{8}{13}$
C) *2,5*
D) *6*

19. Agar ABC uchburchakning burchaklari $\angle A:\angle B:\angle C = 2:3:4$ shartlarni qanoatlantirsa, uchburchakning qaysi tomoni.

A) AC
B) BC
C) *aniqlab bo‘lmaydi*
D) AB

20. Rasmdan foydalanib, x ning qiymatini toping.

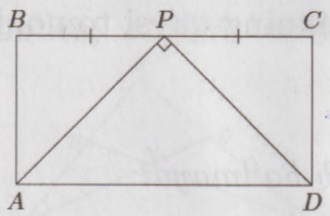


A) *6,5*
B) *berilgan ma’lumotlar yetarli emas*
C) *8*
D) *9*

21. ABC teng yonli ($AB = BC$) uchburchakning A uchidan BC tomoniga AD balandlik o‘tkazilgan. Agar $BD = DC$ bo‘lsa, $\angle ABC$ ni toping.

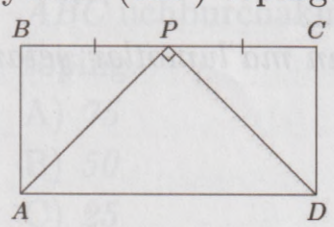
A) *60°*
B) *90°*
C) *75°*
D) *120°*

22. To‘g‘ri to‘rtburchakning AB tomoni 6 cm bo‘lsa, uning yuzini (cm^2) toping.



A) *78*
B) *66*
C) *60*
D) *72*

23. Rasmda $ABCD$ to‘g‘ri to‘rtburchakning AD tomoni 8 cm bo‘lsa, APD uchburchakning yuzini (cm^2) toping.



A) *16*
B) *20*
C) *32*
D) *24*

24. ABC uchburchakda D va E nuqtalar BC tomonini uchta teng qismlarga bo‘ladi ($BD = DE = EC$), F va G nuqtalar esa AD kesmani uchta teng qismlarga bo‘ladi ($AF = FG = GD$). AFE uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{1}{4}$ B) $\frac{1}{3}$
C) $\frac{1}{12}$ D) $\frac{1}{9}$

25. Yon tomoni 5 ga teng bo‘lgan teng yonli uchburchakning asosidan olingan nuqta orqali, yon tomonlariga parallel to‘g‘ri chiziqlar o‘tkazilgan. Hosil bo‘lgan parallelogrammning perimetrini toping.

A) *12* B) *20*
C) *15* D) *10*

26. Bir burchagi 60° bo'lgan to'g'ri burchakli uchburchakka tomoni 6 cm ga teng bo'lgan romb shunday ichki chizilganki, 60° li burchak ular uchun umumiy, rombning qolgan uchlari uchburchakning tomonlarida yotadi. Uchburchakning katta tomoni uzunligini toping.

A) *16 cm*
B) *18 cm*
C) *12 cm*
D) *24 cm*

27. Diametri 15 cm bo'lgan aylanaga yon tomoni 17 cm ga teng bo'lgan teng yonli trapetsiya tashqi chizilgan. Trapetsiyaning katta asosini toping (cm).

A) *10*
B) *9*
C) *14*
D) *25*

28. Teng yonli uchburchakning asosiga tushirilgan balandligi 10 ga, yon tomoniga tushirilgan balandligi 12 ga teng. Uchburchak yuzini toping.

A) *85*
B) *50*
C) *75*
D) *65*

29. Teng yonli uchburchakning asosiga tushirilgan balandligi 5 ga, yon tomoniga tushirilgan balandligi 6 ga teng. Uchburchak yuzini toping.

A) *37, 5*
B) *50*
C) *18, 75*
D) *25*

30. Yuzi $\sqrt{3}$ ga teng bo'lgan $ABCD$ teng yonli trapetsiya aylanaga tashqi chizilgan. Agar $BC{:}AD = 1{:}3$ bo'lsa, AB yon tomonni toping.

A) $\sqrt{2}$
B) *1,5*
C) *2*
D) $\sqrt{3}$

31. Teng yonli uchburchakning perimetri 64 cm ga teng. Agar teng tomonlarining o'rtalarini tutashtiruvchi kesma uzunligi 12 cm bo'lsa, uchburchakka ichki chizilgan aylana diametrini (cm) toping.

A) *12*
B) *6*
C) *9*
D) *8*

32. $ABCD$ parallelogrammda $AB = 10$ cm va $BC = 20$ cm. Parallelogrammning A va D burchaklari bissektrisalari qayerda kesishadi?
A) *parallelogrammning BC tomonida*
B) *parallelogrammning tashqi sohasida*
C) *parallelogrammning ichki sohasida*
D) *parallelogrammning AD tomonida*

33. To'g'ri burchakli uchburchakning o'tkir burchaklarini bissektrisalari kesishishidan hosil bo'lgan o'tmas burchakni toping.
A) 150°
B) 120°
C) 115°
D) 135°

34. Radiusi 8 ga teng bo'lgan aylanaga ichki chizilgan muntazam uchburchakning yuzini toping.
A) $192\sqrt{3}$
B) $48\sqrt{3}$
C) $24\sqrt{3}$
D) 48

35. Aylanaga ichki chizilgan to'g'ri to'rtburchakning tomonlari 5 va 12 ga teng. Aylananing uzunligini toping.
A) 13π
B) 18π
C) 26π
D) $6{,}5\pi$

36. Teng yonli trapetsiyaning katta asosi 24 cm va perimetri 54 cm ga teng. Agar trapetsiyaning diagonali uning o'tkir burchagini teng ikkiga bo'lsa, trapetsiyaning o'rta chizig'ini (cm) toping.
A) $17{,}5$
B) 17
C) 16
D) 18

37. Teng yonli uchburchakning asosi yon tomonidan 2 ga ortiq. Uchburchakning asosiga tushirilgan balandligi 8 ga teng bo'lsa, uning asosini toping.
A) 20
B) 10
C) 16
D) 12

38. Rombning diagonallari 1 va 3 bo‘lsa, unga ichki chizilgan doiraning yuzini toping.

A) $\frac{9}{40}\pi$

B) $\frac{3}{40}\pi$

C) $\frac{9}{20}\pi$

D) $\frac{3}{20}\pi$

39. Agar ABC uchburchakning tomonlari $AB{:}AC{:}BC = 8{:}9{:}7$ nisbatda bo‘lsa, uchburchakning turini aniqlang.

A) *aniqlab bo‘lmaydi*

B) *o‘tmas burchakli uchburchak*

C) *to‘g‘ri burchakli uchburchak*

D) *o‘tkir burchakli uchburchak*

40. To‘g‘ri burchakli uchburchakning tomonlari ayirmasi 2,5 ga teng bo‘lgan arifmetik progressiyani tashkil etadi. Uchburchakning perimetrini toping.

A) *32*

B) *25*

C) *28*

D) *30*

41. Markazi (0; 0) nuqtada bo‘lgan aylanadagi $A(0;\ 2)$ nuqtani soat mili yo‘nalishi bo‘ylab 45°ga burish natijasida hosil bo‘lgan nuqtaning koordinatalari yig‘indisini toping.

A) *0*

B) $2\sqrt{2}$

C) $-\sqrt{2}$

D) $\sqrt{2}$

42. Markazi (0; 0) nuqtada bo‘lgan aylanadagi $A\left(\frac{\sqrt{3}}{2};\frac{1}{2}\right)$ nuqtani soat mili yo‘nalishi bo‘ylab 60°ga burish natijasida hosil bo‘lgan nuqtaning koordinatalari yig‘indisini toping.

A) $\frac{-\sqrt{3}+1}{2}$

B) $\frac{-\sqrt{3}-1}{2}$

C) $\frac{\sqrt{3}+1}{2}$

D) $\frac{\sqrt{3}-1}{2}$

43. Markazi (0; 0) nuqtada bo'lgan aylanadagi $A\left(\frac{\sqrt{3}}{2}; \frac{1}{2}\right)$ nuqtani soat mili yo'nalishi bo'ylab 120°ga burish natijasida hosil bo'lgan nuqtaning koordinatalari yig'indisini toping.

A) $\frac{-\sqrt{3}+1}{2}$

B) $\frac{\sqrt{3}-1}{2}$

C) *-1*

D) *1*

44. Soatning soat mili uch soatda necha gradusga buriladi?

A) *150°*

B) *90°*

C) *120°*

D) *60°*

45. Soatning soat mili 19° burilganda minut mili necha gradus burchakka buriladi?

A) *228°*

B) *114°*

C) *1140°*

D) *570°*

46. AB kesmani A uchidan boshlab hisoblaganda C nuqta 3:4 nisbatda, D nuqta esa AC kesmani 4:3 nisbatda bo'ladi. Agar AB kesmaning uzunligi 49 cm bo'lsa, u holda AD kesmaning uzunligini (cm) toping.

A) *12* B) *16*

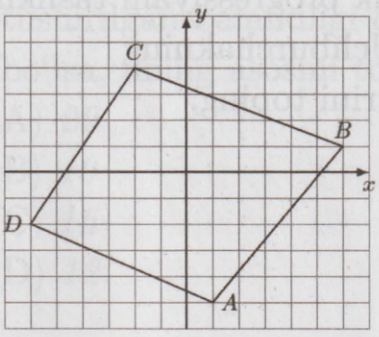
C) *9* D) *21*

47. To'g'ri burchakli uchburchakning o'tkir burchaklarini bissektrisalari kesishishidan hosil bo'lgan o'tkir burchakni toping.

A) *60°* B) *45°*

C) *15°* D) *30°*

48. Koordinatalar o'qida $ABCD$ to'rtburchak tasvirlangan. To'rtburchakning AB tomoni uzunligini toping (har bir katak 1×1 o'lchamli kvadrat).



A) $\sqrt{61}$ B) $\sqrt{62}$

C) $\sqrt{51}$ D) $\sqrt{52}$

49. $ABCD$ rombda $AC > BD$ va $\frac{AC}{BD} - \frac{BD}{AC} = 2$ bo'lsa, $\angle A$ burchakni toping.

A) $arctg2$
B) $45°$
C) $30°$
D) $2arctg2$

50. Radiuslari 1; 2; 3 bo'lgan aylanalar juft-jufti bilan tashqi ravishda urinadi. Urinish nuqtalari orqali o'tuvchi aylana radiusini toping.

A) $\sqrt{2}$
B) 2
C) $\sqrt{3}$
D) 1

51. Teng yonli trapetsiyaning yon tomonlari davom ettirilsa, to'g'ri burchak ostida kesishadi. Agar trapetsiyaning yuzi 24 cm^2 ga, balandligi esa toping.

A) $1\ cm$
B) $2\ cm$
C) $3\ cm$
D) $4\ cm$

52. Parallelogrammning tomonlari 10 va 16, o'tmas burchagi 150° ga teng. Barcha burchaklarining bissektrisalari o'zaro kesishib, to'g'ri to'rtburchak hosil bo'lgan. Shu to'g'ri to'rtburchakning yuzini toping.

A) 13 B) 9
C) 15 D) 12

53. ABC uchburchakning AE va BF medianalari P nuqtada kesishadi. Agar ABC uchburchakning yuzi 60 ga teng bo'lsa, PEF uchburchakning yuzini toping.

A) 7
B) 6
C) 5
D) 4

54. $ABCD$ parallelogrammda C o'tkir burchak. E nuqta AB tomonda yotadi. $AECD$ to'rtburchak yuzining BCE uchburchak yuziga nisbati 4:3 kabi bo'lsa, $AE{:}EB$ nisbatni toping.

A) $\frac{1}{6}$ B) $\frac{1}{5}$
C) $\frac{1}{4}$ D) $\frac{1}{3}$

55. $ABCD$ parallelogrammda D o'tmas burchak. E nuqta AB tomonda yotadi. $BCDE$ to'rtburchak yuzining DAE uchburchak yuziga nisbati 2:1 kabi bo'lsa, $AE{:}EB$ nisbatni toping.

A) *4* B) *2*
C) *5* D) *3*

56. $ABCD$ parallelogrammda C o'tkir burchak. E nuqta AB tomonda yotadi. Agar $AE{:}EB$ nisbat 4:3 kabi bo'lsa, $AECD$ to'rtburchak yuzining BCE uchburchak yuziga nisbatini toping.

A) $\frac{5}{3}$ B) $\frac{7}{3}$
C) $\frac{4}{3}$ D) $\frac{11}{3}$

57. $ABCD$ parallelogrammda D o'tmas burchak. E nuqta AB tomonda yotadi. Agar $AE{:}EB$ nisbat 2:5 kabi bo'lsa, $BCDE$ to'rtburchak yuzining DAE uchburchak yuziga nisbatini toping.

A) $\frac{17}{3}$ B) *6*
C) $\frac{16}{3}$ D) $\frac{14}{3}$

58. $ABCD$ trapetsiyaning AB katta asosida E nuqta olingan. DE kesma BC yon tomoniga parallel. Agar $BCDE$ to'rtburchak yuzining AED uchburchak yuziga nisbati 9:5 kabi bo'lsa, $AE{:}EB$ nisbatni toping.

A) $\frac{3}{2}$ B) $\frac{9}{10}$
C) $\frac{10}{9}$ D) $\frac{2}{3}$

59. $ABCD$ parallelogrammning BC va CD tomonlaridan mos ravishda M va N nuqtalar olingan, bunda $CM{:}MB = 2{:}1$ va $CN{:}ND = 2{:}1$. Agar parallelogrammning yuzi 36 ga teng bo'lsa, AMN uchburchakning yuzini toping.

A) *16* B) *12*
C) *24* D) *8*

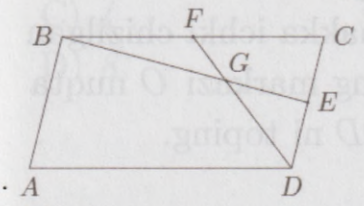
60. ABC uchburchakning AB va BC tomonlaridan mos ravishda E va F nuqtalar olingan, bunda $BE{:}EA = 3{:}2$ va $BF{:}FC = 3{:}2$. Agar ABC uchburchakning yuzi 75 ga teng bo'lsa, AEF uchburchakning yuzini toping.

A) *15* B) *18*
C) *16* D) *20*

61. $ABCD$ parallelogrammning BC, CD tomonlarida mos ravishda yotuvchi M, N nuqtalar $BC{:}MC = 5{:}3$ va $DC{:}NC = 3{:}1$ shartlarni qanoatlantiradi. Agar parallelogrammning yuzi 40 ga teng bo'lsa, $BMND$ to'rtburchakning yuzini toping.

A) *18*
B) *16*
C) *14*
D) *15*

62. Rasmda $ABCD$ parallelogramm tasvirlangan. G nuqta BE va DF kesmalarning kesishish nuqtasi. Agar $BF = FC$ va $CE = ED$ bo'lsa, $\frac{S_{ABCD}}{S_{FCEG}}$ ni toping.

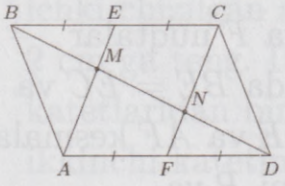


A) *5*
B) *6*
C) *8*
D) *7*

63. To'g'ri burchakli uchburchakka ichki va tashqi aylanalar chizilgan. Agar uchburchakning katetlari 3 va 4 ga teng bo'lsa, aylanalar markazlari orasidagi masofani toping.

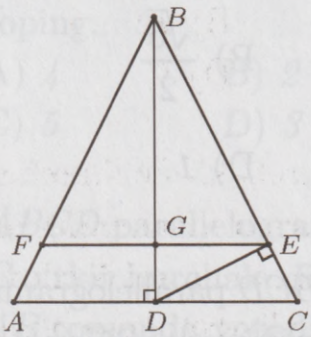
A) $\frac{\sqrt{6}}{2}$ B) $\frac{\sqrt{5}}{2}$
C) $\frac{\sqrt{3}}{2}$ D) *1*

64. Rasmda $ABCD$ parallelogrammda BD diagonal hamda BC va AD tomonlarini mos ravishda teng ikkiga bo'luvchi AE va CF kesmalar o'tkazilgan. Agar FDN uchburchakning yuzi 8 ga teng bo'lsa, BCD uchburchakning yuzini toping.



A) *56*
B) *48*
C) *40*
D) *72*

65. Rasmda ABC teng yonli $(AB = BC)$ uchburchak tasvirlangan. Bunda $BD \perp AC$, $DE \perp BC$ va $EF \parallel AC$. Agar $AB = 13$ va $CD = 6$ bo'lsa, EF ni toping.



A) $\frac{1586}{169}$ B) $\frac{1569}{169}$

C) $\frac{1556}{169}$ D) $\frac{1596}{169}$

66. $ABCD$ parallelogrammning BC va CD tomonlaridan mos ravishda E va F nuqtalar olingan. Bunda $BE = EC$ va $DF = FC$. AE va AF kesmalar BD diagonalni P va Q nuqtalarda kesadi. Agar parallelogramm yuzi 108 bo'lsa, $PQFCE$ beshburchakning yuzini toping.

A) *36*
B) *34*
C) *27*
D) *18*

67. ABC to'g'ri burchakli uchburchakning katetlari 3 va 4 ga teng. C to'g'ri burchakdan gipotenuzaga CD balandlik tushirilgan. ABC to'g'ri burchakli uchburchakka ichki chizilgan aylananing markazi O nuqta bo'lsa, OD ni toping.

A) $\frac{\sqrt{26}}{5}$ B) $\frac{4\sqrt{26}}{5}$

C) $\frac{3\sqrt{26}}{5}$ D) $\frac{2\sqrt{26}}{5}$

68. ABC to'g'ri burchakli uchburchakning katetlari 12 va 16 ga teng. C to'g'ri burchakdan gipotenuzaga CD balandlik tushirilgan. ABC to'g'ri burchakli uchburchakka ichki chizilgan aylananing markazi O nuqta bo'lsa, OD ni toping.

A) $\sqrt{26}$

B) $\frac{4\sqrt{26}}{5}$

C) $\frac{3\sqrt{26}}{5}$

D) $\frac{2\sqrt{26}}{5}$

69. $ABCD$ trapetsiyaning asoslari $BC = 18$ va $AD = 50$. AC diagonal o'tkazilgan. Agar $\angle BAC = \angle ADC$ bo'lsa, AC diagonalning uzunligini toping.

A) *28*
B) *30*
C) *34*
D) *32*

70. Parallelogrammning tomonlari 10 va 14, o'tmas burchagi 150° ga teng. Barcha burchaklarining bissektrisalari o'zaro kesishib, to'g'ri to'rtburchak hosil bo'lgan. Shu to'g'ri to'rtburchakning yuzini toping.

A) *12*
B) *6*
C) *4*
D) *8*

71. To'g'ri burchakli uchburchakka ichki chizilgan aylananing urinish nuqtasi gipotenuzani 5 cm va 12 cm uzunlikdagi kesmalarga bo'ladi. Uchburchakning kichik kateti uzunligini (cm) toping.

A) *7* B) *12*
C) *8* D) *9*

72. To'g'ri burchakli uchburchakka ichki chizilgan aylananing urinish nuqtasi gipotenuzani 5 cm va 12 cm uzunlikdagi kesmalarga bo'ladi. Uchburchakning katta kateti uzunligini (cm) toping.

A) *9* B) *8*
C) *12* D) *15*

73. To'g'ri burchakli uchburchakka ichki chizilgan aylananing radiusi 2 cm ga teng. Uchburchakning katetlaridan biri 8 cm bo'lsa, ikkinchi katetining uzunligini (cm) toping.

A) *6* B) *10*
C) *12* D) *9*

Stereometriya

1. Asosi $2\sqrt{3}$ ga, uchidagi burchagi $120°$ ga teng bo'lgan teng yonli uchburchak o'zining asosi atrofida aylantirilgan. Hosil bo'lgan jismning to'la sirtini toping.

A) 4π B) 8π
C) 2π D) 6π

2. Sakkizburchakli prizmaga ko'pi bilan nechta diagonal kesim o'tkazish mumkin?

A) *20* B) *30*
C) *32* D) *40*

3. Agar prizmaning uchlari soni bilan yoqlari soni yig'indisi 38 bo'lsa, uning diagonallari sonini toping.

A) *108* B) *154*
C) *130* D) *88*

4. Agar prizmaning qirralari soni yoqlari sonidan 22 taga ko'p bo'lsa, prizmaning diagonallari soni uchlari sonidan nechtaga ko'p?

A) *84*
B) *108*
C) *96*
D) *72*

5. Agar piramidaning uchlari soni bilan yoqlari soni yig'indisi 40 bo'lsa, piramida asosining diagonallari sonini toping.

A) *135* B) *152*
C) *189* D) *170*

6. Agar piramidaning uchlari soni bilan yoqlari soni yig'indisi 44 bo'lsa, piramida asosining diagonallari sonini toping.

A) *209* B) *135*
C) *189* D) *170*

7. Agar piramida asosining diagonallari soni bilan uning yoqlari soni yig'indisi 29 ga teng bo'lsa, bu piramidaning qirralar soni uchlari sonidan qanchaga ko'p?

A) *9* B) *6*
C) *7* D) *8*

8. Piramida asosining diagonallari soni piramidaning qirralar sonidan 2 marta katta. Piramidaning yoqlari soni bilan uchlari soni yig'indisini toping.

A) *24* B) *20*
C) *22* D) *26*

9. Piramida asosining diagonallari soni piramidaning qirralar sonidan 3 marta katta. Piramidaning yoqlari soni bilan uchlari soni yig'indisini toping.

A) *28* B) *36*
C) *30* D) *32*

10. Bitta nuqtadan tekislikka og'ma va perpendikular o'tkazilgan bo'lib, ular orasidagi burchak 15° ga teng. Agar perpendikularning uzunligi $10 + 5\sqrt{3}$ cm bo'lsa, og'maning tekislikdagi proyeksiyasi uzunligini (cm) toping.

A) *10*
B) *5*
C) $5(7 - 4\sqrt{3})$
D) $5(7 + 4\sqrt{3})$

11. α tekislik va uni kesib o'tmaydigan $AB = 13$ cm kesma berilgan. AB kesmaning uchlaridan α tekislikkacha bo'lgan masofalar $AA_1 = 3$ cm, $BB_1 = 15$ cm. AB kesma yotuvchi to'g'ri chiziq bilan α tekislik hosil qilgan burchakning kosinusini toping.

A) $\frac{5}{13}$ B) $\frac{12}{13}$
C) $\frac{3}{15}$ D) $\frac{13}{15}$

12. α tekislik va uni kesib o'tmaydigan AB kesma berilgan. Kesmaning uchlaridan α tekislikkacha bo'lgan masofalar $AA_1 = 8$ cm, $BB_1 = 15$ cm. C nuqta AB kesmada joylashgan. AB kesmani A uchidan boshlab hisoblaganda 4:3 nisbatda bo'luvchi C nuqtadan α tekislikkacha bo'lgan masofani (cm) toping.

A) *15*
B) *12,5*
C) *13*
D) *12*

13. α tekislik va uni kesib o'tadigan AB kesma berilgan. Kesmaning uchlaridan α tekislikkacha bo'lgan eng qisqa masofalar $AA_1 = 12$ cm, $BB_1 = 13$ cm. C nuqta AB kesmada joylashgan. AB kesmani A uchidan boshlab hisoblaganda 2:3 nisbatda bo'luvchi C nuqtadan α tekislikkacha bo'lgan eng qisqa masofani (cm) toping.

A) *2*
B) *2,5*
C) *2,4*
D) *3*

14. To'rtburchakli muntazam prizma asosi diagonalining yon yog'i diagonaliga nisbati 2:5 kabidir. Agar bu prizma asosining yuzi 46 dm^2 bo'lsa, uning hajmini (dm^3) hisoblang.

A) $529\sqrt{3}$
B) 1058
C) 529
D) $529\sqrt{2}$

15. Asosi rombdan iborat to'g'ri prizmaning diagonal kesimlarining yuzlari 10 dm^2 va 24 dm^2 ga teng. Shu prizmaning yon sirtining yuzini (dm^2) toping.

A) 39
B) 26
C) 52
D) 48

16. To'g'ri burchakli parallelepipedning qirralari nisbati 2:4:3 kabi. Agar parallelepipedning to'la sirti 208 dm^2 ga teng bo'lsa, uning hajmini (dm^3) toping.

A) 192
B) 172
C) 182
D) 162

17. Agar to'g'ri silindr o'q kesimining yuzi 16 ga teng bo'lsa, silindrning yon sirti yuzini toping.

A) 16π B) 2π
C) 8π D) 4π

18. Konusning to'la sirti 12 ga teng. Agar konus o'q kesimi muntazam uchburchakdan iborat bo'lsa, konus asosining yuzini toping.

A) $4{,}8$ B) 6
C) 4 D) 8

19. Radiusi 6 va 8 ga teng bo'lgan ikki shar markazlari orasidagi masofa 10 ga teng. Shar sirtlari kesishishidan hosil bo'lgan aylananing uzunligini toping.

A) $9{,}6\pi$ B) 10π
C) 8π D) $4{,}8\pi$

20. Kesik konusga shar ichki chizilgan. Agar kesik konus asoslarining radiuslari 3 va 5 bo'lsa, shu konus yon sirtining yuzini toping.

A) 128π
B) 64π
C) 120π
D) 80π

21. Qirrasi 10 ga teng bo'lgan kubning ustki asosining markazi bilan quyi asosining uchlari tutashtirilib piramida hosil qilindi. Hosil bo'lgan piramida yon sirtining yuzini toping.

A) $50\sqrt{5}$
B) $100\sqrt{5}$
C) $200\sqrt{5}$
D) $125\sqrt{5}$

22. Konus asosining radiusi 3 ga, balandligi 4 ga teng. Konus yoyilmasining uchidagi burchagini toping.

A) 288°
B) 216°
C) 270°
D) 210°

23. Radiusi 3 va 4 ga teng bo'lgan ikki shar markazlari orasidagi masofa 5 ga teng. Shar sirtlari kesishishidan hosil bo'lgan aylananing uzunligini toping.

A) $4{,}8\pi$
B) 5π
C) 4π
D) $2{,}4\pi$

24. Konus asosi (aylanasi)dagi 8 ga teng bo'lgan vatar konus asosidan 90° li yoyni tortib turadi. Konus yasovchilari orasidagi eng katta burchak 60° ga teng bo'lsa, konusning yon sirti yuzini toping.

A) 72π B) 54π
C) 81π D) 64π

25. To'g'ri burchakli uchburchakning katetlari 7 va 24 ga teng. Uchburchakning gipotenuzasi orqali o'tuvchi tekislik uchburchak tekisligi bilan 30° li burchak tashkil etadi. Uchburchakning to'g'ri burchagi uchi hamda o'tkazilgan tekislik orasidagi eng qisqa masofani toping.

A) $6{,}72$ B) $3{,}36$
C) 6 D) 4

26. Qirralari 2 dm, 3,1 dm va 4 dm bo'lgan to'g'ri burchakli parallelepiped shaklidagi quti ichiga qirrasi 6 cm bo'lgan kublardan eng ko'pi bilan nechtasini joylashtirish mumkin?

A) 90
B) 72
C) 60
D) 111

27. To'g'ri burchakli parallelepipedning barcha qirralari uzunliklari yig'indisi 60 dm. Agar parallelepipedning diagonali uzunligi $\sqrt{77}$ dm bo'lsa, uning to'la sirtining yuzini (dm^2) toping.

A) *140* B) *132*
C) *148* D) *156*

28. To'g'ri burchakli parallelepipedning barcha qirralari uzunliklari yig'indisi 68 dm. Agar parallelepipedning to'la sirtining yuzi 168 dm^2 bo'lsa, uning diagonali uzunligini (dm) toping.

A) $2\sqrt{61}$ B) $\sqrt{143}$
C) *12* D) *11*

29. To'g'ri burchakli parallelepipedning bir uchidan chiquvchi qirralari a; b va c bo'lib, ular $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{3}$ tenglikni qanoatlantiradi. Agar parallelepiped to'la sirtining yuzi 288 bo'lsa, uning hajmini toping.

A) *288*
B) *144*
C) *576*
D) *432*

30. Bir nuqtadan tekislikka ikkita og'ma o'tkazilgan. Og'malarning uzunliklari 15:13 kabi nisbatda, ularning proyeksiyalari esa mos ravishda 9:5 nisbatda. Agar og'malar va ularning proyeksiyalari uzunliklari natural sonlar bo'lsa, quyidagi sonlardan qaysi biri berilgan nuqtadan tekislikkacha bo'lgan masofaning uzunligi bo'la oladi?

A) *18* B) *9*
C) *12* D) *15*

31. To'g'ri burchakli parallelepipedning uchta turli yoqlarining diagonallari 6 dm; 7 dm va 9 dm bo'lsa, parallelepiped diagonalining uzunligini (dm) hisoblang.

A) $\sqrt{83}$ B) $\sqrt{166}$
C) $\sqrt{85}$ D) $\sqrt{117}$

32. Uchburchakli piramida asosining ikki tomoni 8 dm va 9 dm bo'lib, ular orasidagi burchak 45° ga teng. Agar piramidaning 10 dm bo'lgan yon qirrasi asos tekisligi bilan 30° li burchak tashkil etsa, uning hajmini (dm^3) toping.

A) $60\sqrt{2}$ B) $15\sqrt{2}$
C) $30\sqrt{2}$ D) $120\sqrt{2}$

MASHQ UCHUN JAVOBLAR VARAQASI / ТРЕНИРОВОЧНЫЙ ЛИСТ ОТВЕТОВ

JAVOBLAR VARAQASI

	A	B	C	D		A	B	C	D		A	B	C	D
1					11					21				
2					12					22				
3					13					23				
4					14					24				
5					15					25				
6					16					26				
7					17					27				
8					18					28				
9					19					29				
10					20					30				

Test varianti raqami: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

F.I.Sh: ______________________

JAVOBLAR VARAQASI

	A	B	C	D		A	B	C	D		A	B	C	D
1					11					21				
2					12					22				
3					13					23				
4					14					24				
5					15					25				
6					16					26				
7					17					27				
8					18					28				
9					19					29				
10					20					30				

Test varianti raqami: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

F.I.Sh: ______________________

JAVOBLAR VARAQASI

	A	B	C	D		A	B	C	D		A	B	C	D
1					11					21				
2					12					22				
3					13					23				
4					14					24				
5					15					25				
6					16					26				
7					17					27				
8					18					28				
9					19					29				
10					20					30				

Test varianti raqami: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

F.I.Sh: ______________________

33. Muntazam piramida asosining tomoni 20 dm ga va asosining ichki burchaklarini yig'indisi 720° ga teng bo'lgan ko'pburchakdan iborat. Agar piramidaning yon qirrasi 26 dm ga teng bo'lsa, piramidaning yon sirti yuzini (dm^2) toping.

A) *1440*
B) *1480*
C) *1420*
D) *1460*

34. Uchburchakli piramida asosining tomonlari 10 dm, 12 dm va 14 dm ga teng. Piramidaning barcha yon yoqlari asos tekisligi bilan 45° li burchak tashkil etsa, uning hajmini (dm^3)

A) *64* B) *72*
C) *68* D) *56*

35. Uchburchakli prizmaning yon qirralari orasidagi eng qisqa masofalar 13 cm, 14 cm va 15 sm ga teng. Agar prizmaning yon qirrasi uzunligi 9 cm bo'lsa, uning hajmini (cm^3) toping.

A) *756* B) *765*
C) *774* D) *747*

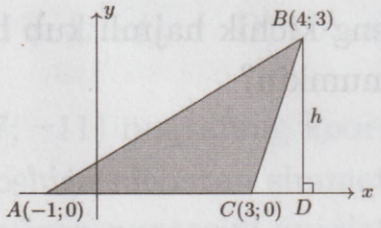
36. Uchlari $S(1; 1; 1)$, $A(1; 7; 1)$, $B(1; 1; 7)$ va $C(7; 1; 1)$ nuqtalarda bo'lgan muntazam uchburchakli piramidaning hajmini toping.

A) $4\frac{2}{15}$ B) *37*
C) *36* D) *35*

37. Katetlari 6 cm va 5 cm ga teng bo'lgan to'g'ri burchakli uchburchakni, gipotenuzasi atrofida to'liq aylantirishdan hosil bo'lgan jismning hajmini (cm^3) toping.

A) $\frac{300\pi\sqrt{61}}{61}$ B) $\frac{300\sqrt{61}}{61}$
C) $\frac{350\pi\sqrt{61}}{61}$ D) $\frac{250\pi\sqrt{61}}{61}$

38. Rasmda uchlari A, B va C nuqtalarda bo'lgan uchburchakni Ox o'qi atrofida to'liq aylantirishdan hosil bo'lgan jism hajmining $\frac{1}{2}$ qismini toping.



A) 9π B) $7{,}5\pi$
C) 6π D) 12π

39. To'la sirtining yuzi 48π ga teng silindrning hajmi eng ko'pi bilan qanchaga teng bo'lishi mumkin?

A) $34\sqrt{2}\,\pi$
B) $32\sqrt{2}\,\pi$
C) $30\sqrt{2}\,\pi$
D) $36\sqrt{2}\,\pi$

40. Uzunligi $\sqrt{108}$ ga teng bo'lgan AB kesmaning uchlari radiusi 6 ga, balandligi 8 ga teng bo'lgan silindrning pastki va yuqori asoslaridagi aylanalarda yotadi. Silindr markaziy o'qidan AB kesmagacha bo'lgan eng qisqa masofani toping.

A) $\sqrt{22}$
B) $\sqrt{18}$
C) 5
D) 4

41. 3 dm×4 dm×8 dm o'lchamdagi to'g'ri burchakli parallelepipedlarning nechtasidan (ularni ustma-ust va yonma-yon terib) eng kichik hajmli kub hosil qilish mumkin?

A) 72
B) 180
C) 216
D) 144

42. To'g'ri burchakli parallelepipedning barcha qirralari uzunliklari yig'indisi 48 dm. Agar parallelepipedning diagonali uzunligi $5\sqrt{2}$ dm bo'lsa, uning to'la sirti yuzini (dm^2) toping.

A) 108
B) 82
C) 94
D) 104

43. To'g'ri burchakli parallelepipedning bir uchidan chiquvchi qirralari a; b va c bo'lib, $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{2}$ tenglikni qanoatlantiradi. Agar parallelepiped to'la sirtining yuzi 288 bo'lsa, uning hajmini toping.

A) 288
B) 432
C) 144
D) 576

44. Silindr sferaga tashqi chizilgan. Sfera sirtining yuzi 20π ga teng. Silindr to'la sirtining yuzini toping.

A) 54π
B) 36π
C) 30π
D) 48π

45. Silindr sferaga tashqi chizilgan. Sfera sirtining yuzi 28π ga teng. Silindr to'la sirtining yuzini toping.

A) 48π
B) 42π
C) 30π
D) 54π

46. Konus asosining yuzi 9π ga, yon sirtining yuzi 15π ga teng. Shu konusga ichki chizilgan sferaning radiusini toping.

A) *2,5*
B) *1*
C) *1,5*
D) *2*

Koordinatalar va vektorlar

1. Agar $\overline{a}\,(x;\,2)$ va $\vec{b}\,(5;\,y)$ kollinear vektorlar bo'lsa, $3xy - 18$ ning qiymatini toping.

A) *12* B) *13*
C) *15* D) *14*

2. Agar $\overline{a}\,(x;\,2)$ va $\vec{b}\,(5;\,y)$ kollinear vektorlar bo'lsa, $3xy - 17$ ning qiymatini toping.

A) *7* B) *13*
C) *3* D) *17*

3. $\overline{a}\,(12;\,5)$ vektor bilan Ox o'qining musbat yo'nalishi bilan hosil qilgan burchak kosinusini toping.

A) $-\frac{12}{5}$ B) $-\frac{12}{13}$
C) $\frac{5}{13}$ D) $-\frac{5}{12}$

4. (5; 4) nuqtani koordinatalar boshiga nisbatan soat mili harakati yo'nalishida 90° ga burish natijasida hosil bo'lgan nuqtaning koordinatalarini aniqlang.

A) *(−4; 5)* B) *(−5; 4)*
C) *(5; −4)* D) *(4; −5)*

5. (3; 4) nuqtani koordinatalar boshiga nisbatan soat mili harakati yo'nalishida 180° ga burish natijasida hosil bo'lgan nuqtaning koordinatalarini aniqlang.

A) *(−4; 3)* B) *(−3; 4)*
C) *(−3; −4)* D) *(3; −4)*

6. (7; −11) nuqtaning koordinatalar boshiga nisbatan simmetrik bo'lgan nuqtasini aniqlang.

A) *(−7; −11)* B) *(7; 11)*
C) *(11; −7)* D) *(−7; 11)*

7. (7; –11) nuqtaning ordinatalar o'qiga nisbatan simmetrik bo'lgan nuqtasini toping.

A) *(–7; –11)*
B) *(–7; 11)*
C) *(11; –7)*
D) *(7; 11)*

8. (7; –11) nuqtaning abssissalar o'qiga nisbatan simmetrik bo'lgan nuqtasini aniqlang.

A) *(–7; –11)*
B) *(–7; –11)*
C) *(11; –7)*
D) *(7; 11)*

9. $A(a; -1)$, $B(1 - a; 2a + 1)$ va $C(a + 1; -3)$ nuqtalar bitta to'g'ri chiziqda yotsa, shu to'g'ri chiziqning burchak koeffitsiyentini toping.

A) *–3*
B) *2*
C) *–2*
D) *3*

10. Uchlari $A(-1; 1)$, $B(3; 1)$ va $C(1; 3)$ nuqtalarda bo'lgan uchburchakning yuzini toping.

A) *4*
B) *3*
C) *6*
D) *8*

11. Uchlari $A(3; 0)$, $B(0; 1)$ va $C(0; 0)$ nuqtalarda bo'lgan uchburchakning CM bissektrisasi bo'lsa, M nuqtaning koordinatalarini toping.

A) $\left(\frac{3}{4}; \frac{3}{4}\right)$
B) $\left(\frac{4}{3}; \frac{4}{3}\right)$
C) $\left(\frac{6}{5}; \frac{6}{5}\right)$
D) $\left(\frac{5}{6}; \frac{5}{6}\right)$

12. $\vec{a}\,(1; 2)$; $\vec{b}\,(2; 1)$ va $\vec{c}\,(x; 1)$ vektorlar uchun $\vec{a}\cdot\vec{c} + \vec{b}\cdot\vec{c} + \vec{a}\cdot\vec{b} = 13$ bo'lsa, x ni toping.

A) *–2* B) *2*
C) *1* D) *–1*

13. A, B, C, D, E va F nuqtalar tartib bo'yicha muntazam oltiburchakning uchlari bo'lsa, quyidagi vektorlardan qaysi biri $\overline{BE}$ vektorga teng?

A) $2\left(\overline{EF} - \overline{ED}\right)$
B) $-2\left(\overline{EF} - \overline{ED}\right)$
C) $-2\left(\overline{EF} + \overline{ED}\right)$
D) $2\left(\overline{EF} + \overline{ED}\right)$

14. A, B, C nuqtalar uchun $\overrightarrow{AB}(-4; 3; -4)$ va $\overrightarrow{AC}(4; 5; -3)$. ABC uchburchakning BC tomonining uzunligini toping.

A) *8,3* B) $\sqrt{65}$

C) *8* D) $\sqrt{69}$

15. $A(-9; 12; -16)$ nuqtadan O_{xz} tekislikkacha bo'lgan masofani toping.

A) *12*

B) *9*

C) *15*

D) *16*

16. $A(-9; 12; -16)$ nuqtadan O_{yz} tekislikkacha bo'lgan masofani toping.

A) *15*

B) *12*

C) *16*

D) *9*

17. $A(-9; 12; -16)$ nuqtadan O_z o'qigacha bo'lgan masofani toping.

A) *9*

B) *16*

C) *12*

D) *15*

18. $\overline{a}(-2; 6; 3)$ vektorning yo'nalishiga qarama-qarshi bo'lgan birlik vektorning koordinatalarini toping.

A) $\left(\frac{2}{7}; \frac{6}{7}; \frac{3}{7}\right)$

B) $\left(-\frac{2}{7}; \frac{6}{7}; \frac{3}{7}\right)$

C) $\left(-\frac{2}{7}; \frac{6}{7}; -\frac{3}{7}\right)$

D) $\left(\frac{2}{7}; \frac{-6}{7}; \frac{-3}{7}\right)$

19. $\overline{a}(12; 16; 15)$ vektorning yo'nalishiga qarama-qarshi bo'lgan birlik vektorning koordinatalarini toping.

A) $\left(-\frac{12}{25}; \frac{16}{25}; \frac{3}{5}\right)$

B) $\left(-\frac{12}{25}; -\frac{16}{25}; \frac{3}{5}\right)$

C) $\left(-\frac{12}{25}; -\frac{16}{25}; -\frac{3}{5}\right)$

D) $\left(\frac{12}{25}; \frac{16}{25}; \frac{3}{5}\right)$

20. Agar $A(-2; 6; -9)$, $B(-12; 6; -9)$, $C(4; 6; 5)$ va $D(14; -8; 15)$ nuqtalar berilgan bo'lsa, $\overline{DA} + \overline{BC} + \overline{CD}$ vektorning koordinatalarini toping.

A) *(10; -11; 8)*
B) *(16; -14; 24)*
C) *(10; 0; 0)*
D) *(-10; 14; -10)*

21. $ABCD$ parallelogramm uchun $\overrightarrow{AB}(3; 5; -7)$ va $\overrightarrow{AD}(-11; 7; 3)$. Parallelogramm diagonallarining keshishgan nuqtasi O bo'lsa, $\overrightarrow{OB}$ vektorning koordinatalari yig'indisini toping.

A) *-1*
B) *1*
C) *2*
D) *-2*

22. $\overline{a}(-2; 6; 3)$ vektor bilan yo'nalishi bir xil bo'lgan birlik vektorning koordinatalarini toping.

A) $\left(\frac{2}{7}; \frac{-6}{7}; \frac{-3}{7}\right)$
B) $\left(-\frac{2}{7}; \frac{6}{7}; -\frac{3}{7}\right)$
C) $\left(-\frac{2}{7}; \frac{6}{7}; \frac{3}{7}\right)$
D) $\left(\frac{2}{7}; \frac{6}{7}; \frac{3}{7}\right)$

23. $\overline{a}(1; 2)$, $\overline{b}(2; 1)$, $\overline{c}(3; 2)$ vektorlar berilgan. k ning qanday qiymatida $\overline{a} + k\overline{b}$ vektor $\overline{c}$ vektorga kollinear bo'ladi?

A) *-4* B) *-2*
C) *4* D) *2*

To'plamlar va ular ustida amallar

1. $A = \{x \mid x \in \mathrm{N},\ 36 = nx,\ n \in N\}$, $B = \{x \mid x \in \mathrm{N},\ 24 = nx,\ n \in N\}$ to'plamlar berilgan. $A \cap B$ to'plamning qism to'plamlari sonini toping.

A) *32*
B) *128*
C) *64*
D) *16*

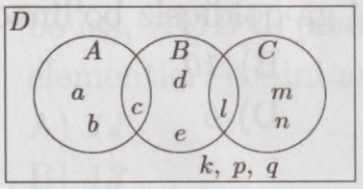
2. A to'plamning elementlari 36 sonining natural bo'luvchilaridan tashkil topgan bo'lsa, A to'plamning elementlari sonini aniqlang.

A) *18*
B) *12*
C) *9*
D) *16*

3. A va B to'plamlarning elementlari mos ravishda 48 va 30 sonlarining natural bo'luvchilaridan iborat bo'lsa, $A \cap B$ to'plamning elementlari sonini aniqlang.

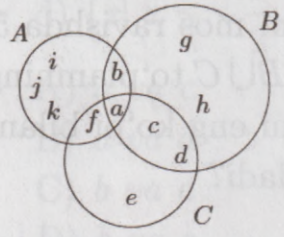
A) *6* B) *8*
C) *12* D) *4*

4. Rasmdan foydalanib, $((A \cap B) \cap C) \cap A$ to'plamning elementlari sonini toping.



A) *3*
B) *0*
C) *4*
D) *1*

5. Rasmda A, B va C to'plamlar tasvirlangan. $(A \cap C) \cap B$ to'plamning elementlarini aniqlang.



A) $\{a, b, c, d\}$
B) $\{a, b, f\}$
C) $\{a, c, d, f\}$
D) $\{a, b, c, d, e, f\}$

6. $A = \{x \mid x \geq 3, x \in Z\}$ to'plamning Z to'plamgacha to'ldiruvchi A' to'plamini toping. $(A' = Z \setminus A)$

A) $A' = \{x \mid x \leq 2, x \in Z\}$
B) $A' = \{x \mid x \in Z\}$
C) $A' = \{x \mid x < 2, x \in Z\}$
D) $A' = \{x \mid x \leq 3, x \in Z\}$

7. a) $\{1; 2\} \subset \{1; 3; 4; 5\}$;
b) $\{1; 3\} \subset \{1; 3; 4; 6\}$;
c) $\{2; 3\} \subset \{1; 2; 4; 5\}$
munosabatlardan to'g'rilarini aniqlang.

A) *faqat b* B) *a va b*
C) *a, b va c* D) *a va c*

8. $A = \{x \mid x = 4n + 2, n \in N\}$ va $B = \{x \mid x = 6n + 4, n \in N\}$ bo'lsa, $A \cap B$ to'plamni aniqlang.

A) $\{x \mid x = 12n + 10, n \in N\}$
B) $\{x \mid x = 12n - 2, n \in N\}$
C) $\{x \mid x = 24n - 14, n \in N\}$
D) $\{x \mid x = 24n - 2, n \in N\}$

9. Agar $A = \{a, b, c, d\}$ bo'lsa, $B \subset A$ $(B \neq A, B \neq \emptyset)$ shartni qanoatlantiruvchi nechta har xil B to'plam mavjud?

A) *32* B) *30*
C) *16* D) *14*

10. Agar $A = \{x|\ x = 8n,\ n \in N\}$ va $B = \{x|\ x = 8n + 4,\ n \in N\}$. bo'lsa, $A \cup B$ to'plamni aniqlang.
A) $\{x|\ x = 8n - 4,\ n \in N\}$
B) $\{x|\ x = 4n + 4,\ n \in N\}$
C) $\{x|\ x = 8n,\ n \in N\}$
D) $\{x|\ x = 4n,\ n \in N\}$

11. $A = \{(x, y)|\ x^2 + y^2 = 4,\ x, y \in R\}$ va $B = \{(x, y)|\ x + y = 2,\ x, y \in R\}$. bo'lsa, $A \cap B$ to'plamni aniqlang.
A) $\{(2; 0); (0; -2)\}$
B) $\{(2; 0); (0; 2)\}$
C) $\{(-2; 0); (0; -2)\}$
D) $\{(-2; 0); (0; 2)\}$

12. $A = \{1; 2; 3; 4\}$ va $B = \{x|\ x = 2n - 1,\ n \in A\}$ bo'lsa, $(A \cap B) \cup B$ to'plamni aniqlang.
A) $\{1; 2; 3; 5; 7\}$
B) $\{1; 2; 3; 5\}$
C) $\{1; 3; 5; 7\}$
D) $\{1; 2; 3; 7\}$

13. 100 kishidan iborat sayyohlar guruhidan 60 %i ingliz tilini, 50 %i fransuz tilini, 18 %i esa ikkala tilni ham biladi. Nechta sayyoh ingliz tilini ham, fransuz tilini ham bilmaydi?
A) *8* B) *6*
C) *7* D) *11*

14. 1; 3; 5 raqamlar takrorlanmasdan yozilgan barcha uch xonali sonlar to'plamining elementlari sonini toping.
A) *8* B) *6*
C) *7* D) *9*

15. A to'plam 1; 2; 3 va 4 raqamlar takrorlanmasdan yozilgan barcha to'rt xonali sonlar to'plami. A to'plamning nechta turli elementi 4 ga qoldiqsiz bo'linadi?
A) *8* B) *10*
C) *12* D) *6*

16. A, B va C to'plamlarning elementlari soni mos ravishda 10; 12 va 15 ta. $A \cap B \cap C$ to'plamning elementlari soni eng ko'pi bilan nechta bo'la oladi?
A) *27* B) *15*
C) *37* D) *10*

17. A, B va C to'plamlarning elementlari soni mos ravishda 5; 7 va 8 ta. $A \cup B \cup C$ to'plamning elementlari soni eng ko'pi bilan nechta bo'la oladi?
A) *8*
B) *12*
C) *20*
D) *15*

18. $A = \{a; b; c; d; e; f\}$, to'plamning nechta qism to'plamida b elementi bo'lib, c elementi qatnashmaydi?

A) *28*
B) *16*
C) *8*
D) *32*

19. Agar $A = \{x| -5 < x \leq 19, x \in Z\}$, $B = \{x| x < 8, x \in Q\}$ bo'lsa, $A \cup B$ to'plamning elementlari sonini aniqlang.

A) *14*
B) *13*
C) *12*
D) *cheksiz ko'p*

20. Quyida berilgan to'plamlardan qaysilari chekli?

a) $\{x| -1000 \leq x \leq 10, x \in Z\}$;
b) $\{x| -17 \leq x \leq 17, x \in R\}$;
c) $\{x| -700 \leq x \leq 70, x \in N\}$;
d) $\{x| x \leq -\frac{1}{2}, x \in Q\}$

A) *a va c*
B) *a va d*
C) *b va d*
D) *b va c*

21. Quyidagilardan qaysilari cheksiz to'plam bo'ladi?

a) $\{x| 0 \leq x \leq 9, x \in Z\}$;
b) $\{x| 0 \leq x \leq 1, x \in R\}$;
c) $\{x| -7 \leq x \leq 9, x \in N\}$;
d) $\{x| x \leq 1, x \in Q\}$

A) *a va c*
B) *a va d*
C) *b va d*
D) *b va c*

22. $A = \{a; b; c; d; e\}$ to'plamning nechta qism to'plamlarida b va c elementlari qatnashadi?

A) *16*
B) *8*
C) *24*
D) *32*

23. $A = \{a; b; c; d; e; f\}$ to'plamning nechta qism to'plamlarida b va c elementlar qatnashmaydi?

A) *24* B) *32*
C) *16* D) *8*

24. $A = \{a; b; c; d; e; f; h\}$ to'plamning nechta qism to'plamlarida b element mavjud bo'lib, d element mavjud bo'lmaydi?

A) *32* B) *8*
C) *16* D) *28*

Kombinatorika va ehtimollar nazariyasi

1. 1; 2; 3; 4; 5; 6 raqamlardan nechta har xil (raqamlari takrorlanmaydigan) uch xonali sonlar tuzish mumkin?

A) *24* B) *60*
C) *144* D) *120*

2. Javonda 11 ta turli kitob bor. Diyora javondan ixtiyoriy 3 ta kitobni necha xil usul bilan olishi mumkin?

A) *165*
B) *198*
C) *330*
D) *231*

3. Ixtiyoriy uchtasi bir to‘g‘ri chiziqda yotmagan 9 ta nuqtani o‘zaro tutashtirib, ko‘pi bilan nechta har xil kesma hosil qilish mumkin?

A) *9* B) *45*
C) *72* D) *36*

4. Bir-biri bilan ustma-ust tushmaydigan 7 ta to‘g‘ri chiziq ko‘pi bilan nechta nuqtada kesishadi?

A) *36* B) *21*
C) *28* D) *15*

5. Tog‘ning cho‘qqisiga 5 ta yo‘l olib boradi. Borgan yo‘lidan qaytmaslik sharti bilan tog‘ning cho‘qqisiga jami necha xil usulda borib kelish mumkin?

A) *10*
B) *20*
C) *15*
D) *30*

6. Tog‘ning cho‘qqisiga 9 ta yo‘l olib boradi. Borgan yo‘lidan qaytmaslik sharti bilan tog‘ning cho‘qqisiga jami necha xil usulda borib kelish mumkin?

A) *90*
B) *45*
C) *36*
D) *72*

7. Tekislikda kesishmaydigan a va b to‘g‘ri chiziqlar berilgan. a to‘g‘ri chiziqda 2 ta, b to‘g‘ri chiziqda 8 ta nuqta berilgan. Uchlari bu nuqtalarda bo‘lgan jami nechta to‘rtburchak mavjud?

A) *30*
B) *14*
C) *16*
D) *28*

8. Aylanada 5 ta har xil nuqta belgilangan. Uchlari bu nuqtalarda bo'lgan jami nechta har xil uchburchak chizish mumkin?
A) *15* B) *10*
C) *9* D) *12*

9. Tekislikda ixtiyoriy uchtasi bitta to'g'ri chiziqda yotmaydigan 10 ta nuqta berilgan. Uchlari berilgan nuqtalarda bo'lgan jami nechta turli kesma mavjud?
A) *40* B) *41* C) *42* D) *45*

10. Tekislikda ixtiyoriy uchtasi bitta to'g'ri chiziqda yotmaydigan 7 ta nuqta berilgan. Uchlari shu nuqtalarda bo'lgan jami nechta har xil uchburchak mavjud?
A) *32* B) *34*
C) *30* D) *35*

11. 2 ta bir xil kitobni 12 ta o'quvchidan 2 tasiga bittadan berish sharti bilan necha xil usulda berish mumkin?
A) *132* B) *78*
C) *66* D) *156*

12. 7 kishidan 5 kishini va bu 5 kishidan 1 kishini necha xil usulda tanlab olish mumkin?
A) *140* B) *210*
C) *175* D) *105*

13. Tekislikda ixtiyoriy uchtasi bitta to'g'ri chiziqda yotmaydigan A, B, C, D va E nuqtalarni uchburchaklarning uchlari deb hisoblasak, nechta uchburchakda C nuqta qatnashadi?
A) *7* B) *4*
C) *6* D) *8*

14. Tashkilot 10 ta xodimidan 4 tasini Buxoroga xizmat safariga yuboradigan bo'ldi. Tashkilot bu guruhni necha xil usulda tuzishi mumkin?
A) *180* B) *240*
C) *196* D) *210*

15. 4132 sonning raqamlari joylarini almashtirib, 3 bilan tugaydigan nechta har xil son hosil qilish mumkin?
A) *8* B) *6*
C) *4* D) *5*

16. Tanga 7 marta tashlanganda 6 marta gerb va 1 marta raqam tomoni tushishining ehtimolligini toping.
A) $\frac{7}{128}$ B) $\frac{21}{128}$
C) $\frac{1}{128}$ D) $\frac{6}{49}$

17. Merganning nishonga tekkizish ehtimoli 0,9 ga teng. U nishonga 2 marta o‘q uzganda o‘qlaridan biri nishonga tegishining ehtimolligini toping. (Merganning nishonga tekkizish ehtimolliklari bir xil.)

A) *0,9*
B) *0,18*
C) *0,5*
D) *0,09*

18. 3 ta mergan bir-biriga bog‘liq bo‘lmagan holda nishonga bir martadan o‘q uzishmoqda. Har birining nishonga tekkizish ehtimolligi mos ravishda 0,7; 0,6 va 0,8 ga teng. Nishonga 3 ta o‘qning tegishi ehtimolligini toping.

A) *0,48*
B) *0,42*
C) *0,336*
D) *0,56*

19. O‘quvchi 4 ta oson va 3 ta qiyin masaladan, 2 ta oson va 1 ta qiyin masalani jami necha xil usulda tanlashi mumkin.

A) *20*
B) *18*
C) *16*
D) *12*

20. Ixtiyoriy uchtasi bir to‘g‘ri chiziqda yotmagan 10 ta nuqtani o‘zaro tutashtirib, ko‘pi bilan nechta har xil kesma hosil qilish mumkin?

A) *90* B) *10*
C) *55* D) *45*

21. 0, 1, 2, 3, 4, 5 raqamlaridan jami nechta (raqamlari takrorlanadigan) 3 xonali son tuzish mumkin?

A) *125* B) *216*
C) *210* D) *180*

22. 3 ta mergan bir-biriga bog‘liq bo‘lmagan holda nishonga bir martadan o‘q uzishmoqda. Har birining nishonga tekkizish ehtimolligi mos ravishda 0,7; 0,6 va 0,5 ga teng. Nishonga 3 ta o‘qning tegishi ehtimolligini toping.

A) *0,42* B) *0,3*
C) *0,35* D) *0,21*

23. 10 ga bo‘lganda 1 qoldiq qoladigan va raqamlari takrorlanmaydigan uch xonali sonlar nechta?

A) *90* B) *81*
C) *72* D) *64*

MATEMATIKA 2020

DAVLAT TEST MARKAZI

Ushbu to‘plamdan, asosan, O‘zbekiston Respublikasi oliy ta’lim muassasalari bakalavriatiga 2020–2021-o‘quv yili uchun kirish test sinovlarida foydalanilgan test topshiriqlari o‘rin olgan. Shuningdek, 2021–2022-o‘quv yili uchun qabul test sinovlarida foydalanilishi mo‘ljallanagan yangicha shakl va mazmundagi test topshiriqlaridan namunalar keltirilgan. To‘plam o‘qituvchilar, oliy ta’lim muassasalariga kirish uchun tayyorgarlik ko‘rayotgan abituriyentlar va keng jamoatchilik uchun mo‘ljallangan.

To‘plamda mavjud test topshiriqlari avvalgi yillarda amalda qo‘llanilgan darsliklar asosida shakllantirilganligi tufayli joriy o‘quv yilida amalda qo‘llanilayotgan darsliklardagi ma’lumotlar bilan tafovut bo‘lishi mumkin.

Test topshiriqlari mazmuni bo‘yicha takliflar va fikr-mulohazalaringizni test@dtm.uz elektron manziliga yuborishingizni so‘raymiz.

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