

**O'ZBEKISTON RESPUBLIKASI MAKTABGACHA VA MAKTAB TA'LIMI VAZIRLIGI
PEDAGOGIK MAHORAT VA XALQARO BAHOLASH ILMIY-AMALIY MARKAZI**

**2023-2024 O'QUV YILIDA IXTISOSLASHTIRILGAN
MAKTABLARNING 11-SINF O'QUVCHILARI UCHUN**

MATEMATIKA

**FANIDAN YAKUNIY ATTESTATSIYASINI O'TKAZISH
BO'YICHA METODIK TAVSIYA VA MATERIALLAR**



2023-2024-O'QUV YILIDA IXTISOSLASHTIRILGAN MAKTABLARINING 11-SINF O'QUVCHILARI UCHUN YAKUNIY NAZORAT IMTIHONINI O'TKAZISH BO'YICHA MATEMATIKA FANIDAN SPETSIFIKATSIYASI

Tuzuvchilar: Xolmatov Axmad Amirovich "O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vazirligi huzuridagi ixtisoslashtirilgan ta'lim muassasalari agentligi tizimidagi Muhammad Al-Xorazmiy nomidagi ixtisoslashtirilgan maktab" matematika o'qituvchisi.

Taqrizchilar: M. A. Mirzaxmedov Xalqaro baholash va pedagogik mahorat ilmiy-amaliy markazi.

D.E. Shnol- Ta'lim bo'yicha xalqaro ekspert.

Ixtisoslashtirilgan ta'lim muassasalari agentligi tasarrufidagi maktablarning 11- sinfini tugatgan o'quvchilar matematika fanidan ixtisoslashtirilgan maktablar uchun ta'lim dasturi bo'yicha ma'lum darajadagi kompetensiyalarga ega bo'ladilar.

O'quvchilarning olgan bilim, ko'nikma va malakalarini aniqlash uchun 2023– 2024-o'quv yilida 11-sinflarda yakuniy imtihon yozma shaklda o'tkaziladi.

Har bir imtihon biletining savol va topshiriqlari matematika fani bo'yicha Ixtisoslashtirilgan maktablarning 8-9-10-11-sinflari mavzularini qamrab olgan. Shuningdek, tavsiyada bilishga oid savollar, qo'llashga va mulohazaga oida topshiriqlar bo'yicha baholash mezonlari keltirilgan.

Har bir o'quvchi bittadan biletni tanlab oladi. Biletda o'quvchiga 20 (12 ta algebra, 8 ta geometriya) tadan savol beriladi. Savollarning 5 (3 ta algebra, 2 ta geometriya) tasi bilishga, 13 (8 ta algebra, 5 ta geometriya) tasi qo'llashga, 2 (1 ta algebra, 1 ta geometriya) tasi mulohazaga oid bo'ladi. Bilet savollariga javob berishi uchun 240 daqiqa vaqt beriladi.

O'quvchilarning yozma ishlari algebra va geometriya fanlarining har biri uchun alohida 100 ballik tizim asosida:

0 – 45% – “2”;

46–65% – “3”;

66–85% – “4”;

86–100% – “5”

baho kabi baholanadi. Har bir topshiriq uchun belgilangan balldan yuqori ball qo'yilishiga yo'l qo'yilmaydi.

Matematika	Soni	Bilish	Qo'llash	Mulohaza	Javobi tanlanadigan	Javobsiz	To'liq yechim
Algebra va funksiyalar	5	1	4		2	2	1
Statistika va ehtimol	3	1	2		1	2	
Matematik analiz	4	1	2	1		2	2
Planimetriya	4	1	3		1	2	1
Stereometriya	4	1	2	1	1	2	1

TOPSHIRIQ BO'YICHA BAHOLASH MEZONI

№	Bo'lim nomi		Topshiriq turi	Topshiriq shakli	Baholash mezon								
Algebra va funksiyalar													
1	Funksiyalar (grafiklarni o'qish)	B	Jadval	Moslikni aniqlash <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">A)</td> <td style="padding: 2px;">B)</td> <td style="padding: 2px;">C)</td> <td style="padding: 2px;">D)</td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>	A)	B)	C)	D)					A) B), C), D) topshiriqlarning javoblarini mos ravishda jadvalga kiritish kerak bo'ladi. Agar o'quvchi 4 ta topshiriqdan: 1-hol. Faqat bittasiga to'g'ri javob bergan bo'lsa, 0,5 ball ; 2-hol. Berilgan topshiriqlardan 2 tasiga to'g'ri javob bergan bo'lsa, 1 ball ; 3-hol. Berilgan topshiriqlardan 3 tasiga javob bergan bo'lsa, 1,5 ball ; 4-hol. Berilgan topshiriqlarning barchasiga to'g'ri javob bersa, 2,5 ball beriladi. Xato javob uchun 0 ball beriladi.
A)	B)	C)	D)										
2	Trigonometrik tenglamalar	Q	Bir tanlovli test	A,B,C,D	A, B, C, D variantli testlar bir tanlovli test sanaladi. Variantida bitta to'g'ri javob bo'lib, to'g'ri javob uchun 10 ball beriladi. Xato javob uchun 0 ball beriladi.								
3	Logarifmik va ko'rsatkichli tenglamalar	Q	Bir tanlovli test	A,B,C,D	A, B, C, D variantli testlar bir tanlovli test sanaladi. Variantida bitta to'g'ri javob bo'lib, to'g'ri javob uchun 10 ball beriladi. Xato javob uchun 0 ball beriladi.								
4	Trigonometrik tengsizliklar	Q	Qisqa javobli	Javob: <hr style="width: 100%; border: 0.5px solid black;"/>	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 10 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.								

5	Logarifmik va ko'rsatkichli tengsizliklar	Q	To'la yechimli	Asoslangan yechim va javobni keltirish	O'quvchi topshiriqni bajarishda Logarifmik (ko'rsatkichli) tengsizlik xossalarini to'g'ri qo'llab, tengsizlikni to'liq yechib, masala shartini to'liq bajarsa, 10 ball bilan baholanadi.								
Matematik analiz asoslari													
6	Hosila yordamida yechiladigan masalalar	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 10 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.								
7	Boshlang'ich funksiya	B	Jadval	Moslikni aniqlash <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table>	1	2	3	4					Jadval ko'rinishidagi topshiriqda, har bir savolga uning javobini mos keltirish kerak bo'ladi. 4 ta savol va 4 tadan ko'p javob variantlari beriladi. Moslikni hammasini to'g'ri topgan bo'lsa, 2,5 ball beriladi. Xato javob uchun 0 ball beriladi.
1	2	3	4										
8	Integral: integrallash usullari, aniq integral (integraldagi funktsiyani soddalashtirish lozim bo'lgan), shakl yuzini topish	Q	To'la yechimli	Asoslangan yechim va javobni keltirish	O'quvchi topshiriqni bajarishda integrallash usullari, aniq integraldagi funktsiyani soddalashtirib, shakl yuzini topaolsa, 10 ball bilan baholanadi.								
9	Egri chiziqli trapetsiya. Jism hajmini topish	M	To'la yechimli	Asoslangan yechim va javobni keltirish	O'quvchi topshiriqni bajarishda masala uchun chizma shart bo'lib, chizmalar to'g'ri chizilgan bo'lsa, integrallash usullari, aniq integraldagi funktsiyani soddalashtirib, shakl hajmini (yuzini) topaolsa, 12,5 ball bilan baholanadi.								
Matematik statistika va ehtimollar nazariyasi													

10	Moda, mediana, o'rtta qiymat, korrelyatsiya	B	Bir tanlovli test	A,B,C,D	A, B, C, D variantli testlar bir tanlovli test sanaladi. Variantida bitta to'g'ri javob bo'lib, to'g'ri javob uchun 2,5
					ball beriladi. Xato javob uchun 0 ball beriladi.
11	Binomial koeffitsiyentlarni topish	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 10 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.
12	Hodisalar ustida amallar	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 10 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.
Planimetriya:					
13	Sinuslar va kosinuslar teoremlari	Q	To'la yechimli	Asoslangan yechim va javobni keltirish	O'quvchi topshiriqni bajarishda kerakli xossa qonuniyatlarning ma'nosini to'la ochib bersa, qonunlarni qo'llab masalani to'g'ri yechsa, masala uchun chizma shart bo'lib, chizmalar to'g'ri chizilgan bo'lsa va o'lchov birliklari to'g'ri keltirilgan bo'lsa 13 ball bilan baholanadi.
14	To'rtburchaklar	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 13 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.
15	Ko'pburchaklar	B	Bir tanlovli test	A,B,C,D	A, B, C, D variantli testlar bir tanlovli test sanaladi. Variantida bitta to'g'ri javob bo'lib, to'g'ri javob uchun 10 ball beriladi. Xato javob uchun 0 ball beriladi.
16	Aylana va doira	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 13 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.
Stereometriya:					
17	Prizma va silindr	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo'lib, to'g'ri javob uchun 13 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.

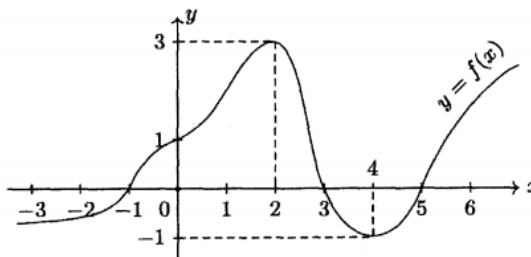
18	Piramida va konus	Q	Qisqa javobli	Javob: _____	Javobi yoziladigan test bo‘lib, to‘g‘ri javob uchun 13 ball bilan baholanadi. Xato javob uchun 0 ball beriladi.
19	Shar va sfera	B	Bir tanlovli test	A,B,C,D	A, B, C, D variantli testlar bir tanlovli test sanaladi. Variantida bitta to‘g‘ri javob bo‘lib, to‘g‘ri javob uchun 10 ball beriladi. Xato javob uchun 0 ball beriladi.
20	Geometrik jismlar kombinatsiyasi	M	To‘la yechimli	Asoslangan yechim va javobni keltirish	O‘quvchi topshiriqni bajarishda kerakli xossa qonuniyatlarning ma’nosini to‘la ochib bersa, qonunlarni qo‘llab masalani to‘g‘ri yechsa, masala uchun chizma shart bo‘lib, chizmalar to‘g‘ri chizilgan bo‘lsa va o‘lchov birliklari to‘g‘ri keltirilgan bo‘lsa 15 ball bilan baholanadi.

11-SINF O'QUVCHILARI UCHUN MATEMATIKA FANIDAN YAKUNIY DAVLAT ATTESTATSIYA TOPSHIRIQLAR

1	Funksiyalar (grafiklarni o'qish)	B	Jadval	Moslikni aniqlash								
				<table border="1" style="margin: auto;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	1	2	3	4				
1	2	3	4									

1. Rasmda $x \in (-2; 6)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib quyidagi ifodalarning qiymatini toping.

- A) $f'(2) + f(2)$
- B) $f'(4) + f(4)$
- C) $f'(2) + f(0)$
- D) $f'(4) + f(0)$

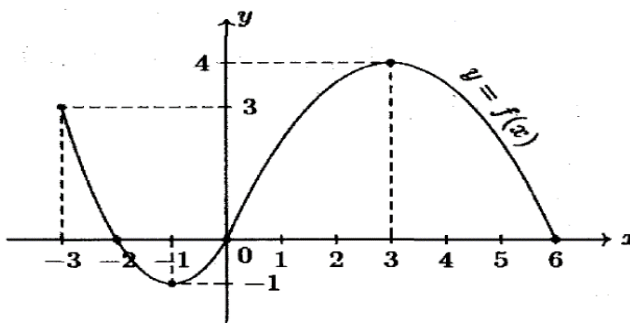


A)	B)	C)	D)

Javob: _____

2. Rasmda $x \in [-3; 6]$ kesmada $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-1) + f(-1)$
- B) $f'(3) + f(3)$
- C) $f'(-1) + f(3)$
- D) $f'(3) + f(-1)$

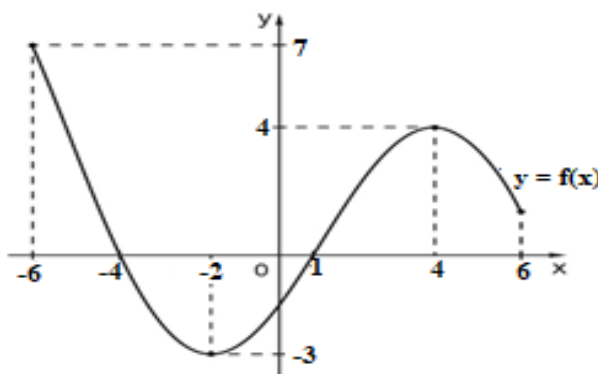


A)	B)	C)	D)

Javob: _____

3. Rasmda $x \in [-6; 6]$ kesmada $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib quyidagi ifodalarning qiymatini toping.

- A) $f'(-2) + f(-2)$
- B) $f'(4) + f(-6)$
- C) $f'(4) + f(-4)$
- D) $f'(-2) + f(4)$

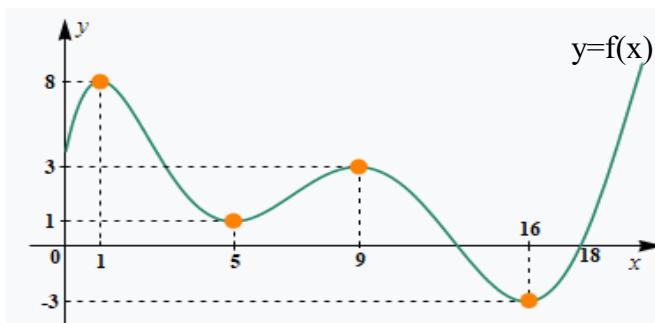


A)	B)	C)	D)

Javob: _____

4. Rasmda $x \in (0; 18)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(1) + f(16)$
 B) $f'(9) + f(1)$
 C) $f'(16) + f(5)$
 D) $f'(5) + f(9)$

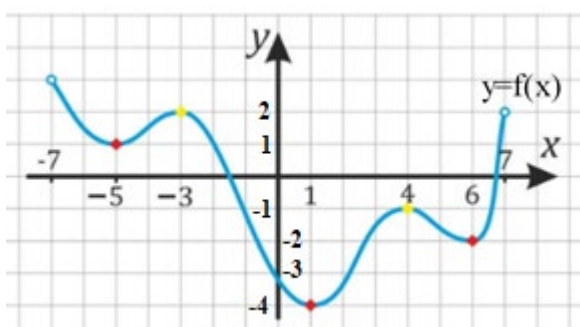


A)	B)	C)	D)

Javob: _____

5. Rasmda $x \in (-7; 7)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-5) + f(6)$
 B) $f'(1) + f(4)$
 C) $f'(-3) + f(-5)$
 D) $f'(4) + f(1)$

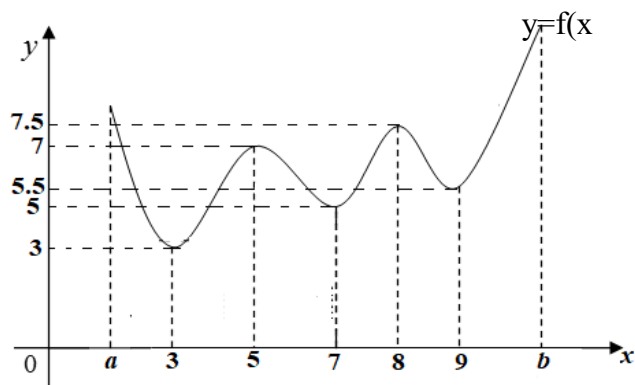


A)	B)	C)	D)

Javob: _____

6. Rasmda $x \in (a; b)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(3) + f(9)$
 B) $f'(5) + f(8)$
 C) $f'(7) + f(5)$
 D) $f'(9) + f(3)$

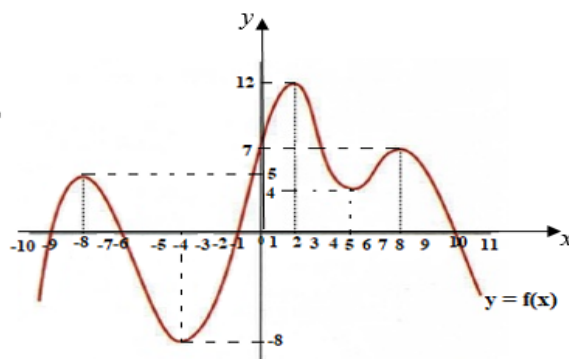


A)	B)	C)	D)

Javob: _____

7. Rasmda $x \in (-10; 11)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-8) + f(8)$
 B) $f'(5) + f(-4)$
 C) $f'(2) + f(5)$
 D) $f'(8) + f(-8)$

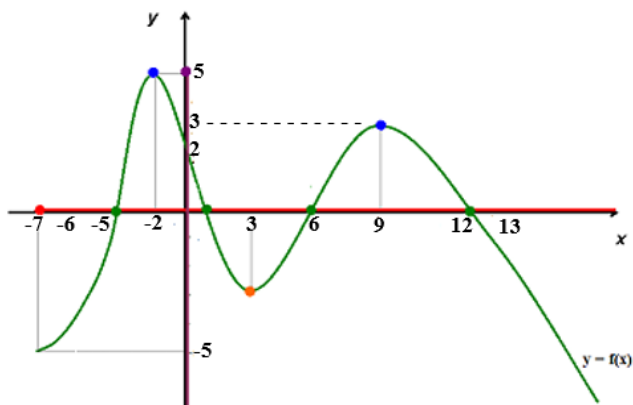


A)	B)	C)	D)

Javob: _____

8. Rasmda $x \in [-7; 13]$ kesmada $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-2) + f(-7)$
- B) $f'(3) + f(-5)$
- C) $f'(9) + f(-2)$
- D) $f'(3) + f(9)$

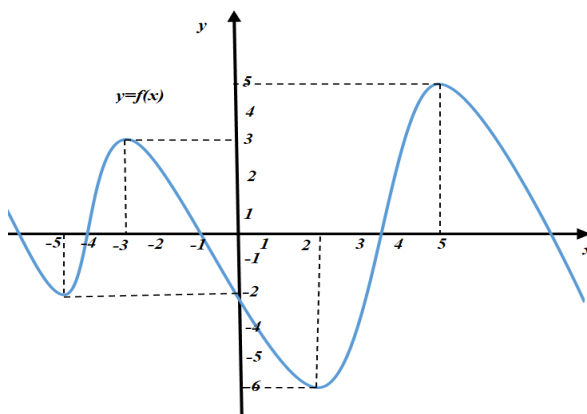


Javob:

A)	B)	C)	D)

9. Rasmda $x \in (-6; 9)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(5) + f(-3)$
- B) $f'(-3) + f(2)$
- C) $f'(-5) + f(5)$
- D) $f'(2) + f(-1)$

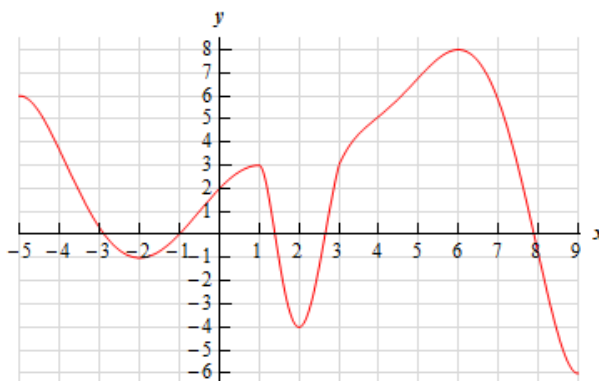


Javob:

A)	B)	C)	D)

10. Rasmda $x \in (-5; 9)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-2) + f(1)$
- B) $f'(1) + f(6)$
- C) $f'(6) + f(2)$
- D) $f'(2) + f(-2)$

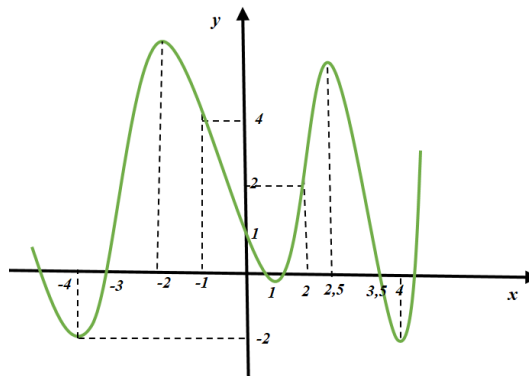


Javob:

A)	B)	C)	D)

11. Rasmda $x \in (-6; 5)$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping:

- A) $f'(4) + f(2)$
- B) $f'(-2) + f(0)$
- C) $f'(-4) + f(-1)$
- D) $f'(2,5) + f(3,5)$

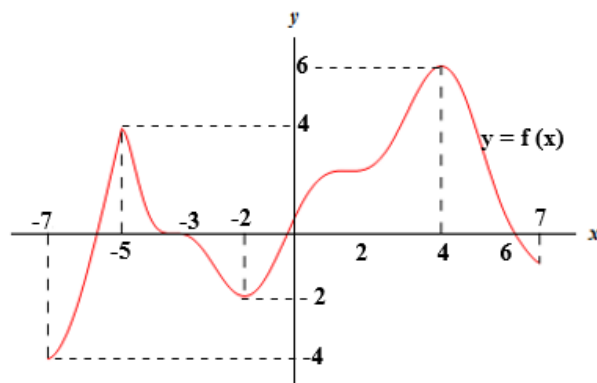


Javob:

A)	B)	C)	D)

12. Rasmda $x \in [-7; 7]$ oraliqda $f(x)$ funksiya grafigi keltirilgan. Bu grafikdan foydalanib, quyidagi ifodalarning qiymatini toping.

- A) $f'(-5) + f(-7)$
- B) $f'(-2) + f(-5)$
- C) $f'(4) + f(-2)$
- D) $f'(-2) + f(4)$



Javob:

A)	B)	C)	D)

Boshlang'ich funksiya	B	Jadval	Moslikni aniqlash								
			<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td></td> </tr> </table>	1	2	3	4				
1	2	3	4								

1. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. x^4	A. $\ln x + c$
2. x^{-1}	B. $\frac{2^x}{\ln 2} + c$
3. 2^x	C. $\frac{x^5}{5} + c$
4. $\sin kx$	D. $-\frac{1}{2x^{-2}} + c$
	E. $-k \cos kx + c$
	F. $-\frac{1}{k} \cos kx + c$

1	2	3	4

Javob: _____

2. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. x^5	A. $\frac{1}{k} \sin kx + c$
2. x^{-2}	B. $-\frac{1}{x} + c$
3. e^{3x}	C. $\ln 3x + c$
4. $\cos kx$	D. $\frac{x^6}{6} + c$

	E. $\frac{1}{3} e^{3x} + c$
	F. $-k \cos kx + c$

1	2	3	4

Javob: _____

3. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. 3^x	A. $\frac{1}{2} \ln 2x + 1 + c$
2. $\frac{1}{\cos^2 x}$	B. $\frac{3^x}{\ln 3} + c$
3. $\frac{1}{2x+1}$	C. $-\frac{1}{2} \cos(2x + 1) + c$
4. $\sin(2x + 1)$	D. $-\frac{1}{2x^{-2}+1} + c$
	E. $-2 \cos(2x + 1) + c$
	F. $tgx + c$

1	2	3	4

Javob: _____

4. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $\frac{1}{\sin^2 x}$	A. $\ln x + c$
2. x^{-1}	B. $\frac{2x\sqrt{x}}{3} + c$
	C. $\frac{2x^5 - 10x}{5} + c$
3. $2x^4 - 2$	D. $-\frac{1}{2\sqrt{x}} + c$
4. \sqrt{x}	E. $-ctgx + c$
	F. $-\frac{1}{2} \cos^2 x + c$

1	2	3	4

Javob: _____

5. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. e^{5x}	A. $-\ln \cos x + c$
2. x^3	B. $\frac{e^{5x}}{5} + c$
3. tgx	C. $\frac{x^4}{4} + c$
4. $\sqrt[3]{x}$	D. $\frac{3x\sqrt[3]{x}}{4} + c$
	E. $-\cos x + c$
	F. $-\frac{1}{3\sqrt[3]{x}} + c$

1	2	3	4

Javob: _____

6. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. x^2	A. $2x + c$
2. $\frac{1}{\sqrt{x}}$	B. $\ln \sin x + c$
3. $\frac{1}{2x}$	C. $\frac{x^3}{3} + c$
4. $ctgx$	D. $2\sqrt{x} + c$
	E. $\frac{1}{2}\ln x + c$
	F. $\ln 2x + c$

1	2	3	4

Javob: _____

7. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $x^{\frac{1}{2}}$	A. $1 - \cos x + c$
	B. $-\cos(x + 1) + c$

2. x^{-2}	C. $-x^{-1} + c$
3. $\frac{1}{1+x^2}$	D. $-\frac{1}{2x^{-2}} + c$
4. $\sin(x + 1)$	E. $\frac{2\sqrt{x^3}}{3} + c$
	F. $\arctg x + c$

1	2	3	4

Javob: _____

8. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $\frac{1}{1-x^2}$	A. $2e^2 + c$
2. e^2	B. $\frac{1}{2} \ln \left \frac{1+x}{1-x} \right + c$
3. $2x^3$	C. $\frac{x^4}{2} + c$
4. $\text{tg} 2x$	D. $-\frac{1}{2} \ln \cos 2x + c$
	E. $-\frac{2}{x} + c$
	F. $e^2 \cdot x + c$

1	2	3	4

Javob: _____

9. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $\frac{1}{\sqrt{1-x^2}}$	A. $\frac{x^2}{2} - 3x + c$
2. $x - 3$	B. $\frac{5^x}{\ln 5} + c$
3. 5^x	C. $\frac{2x}{\sqrt{1-x^2}} + c$
4. $2\cos^2 x$	D. $\arcsin x + c$
	E. $x + \frac{1}{2} \sin 2x + c$
	F. $2 \cos x \cdot \sin x + c$

1	2	3	4

Javob: _____

10. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. 3^4	A. $\text{arcctg}x + c$
2. $\frac{1}{x+1}$	B. $81x + c$
	C. $\frac{1}{2}\sin 2x - x + c$
3. $-2\sin^2 x$	D. $-\frac{1}{2x^2+1} + c$
4. $-\frac{1}{1+x^2}$	E. $-4\sin x \cdot \cos x + c$
	F. $\ln x+1 + c$

1	2	3	4

Javob: _____

11. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $\frac{1}{5}x^4$	A. $-2\ln x + c$
	B. $9\sin\frac{x}{3} + c$
2. $-\frac{2}{x}$	C. $\frac{x^5}{25} + c$
	D. $-\frac{2}{x^{-2}} + c$
3. $x\sqrt{x}$	E. $\frac{2}{5}\sqrt{x^5} + c$
4. $3\cos\frac{x}{3}$	F. $-\frac{1}{3}\cos 3x + c$

1	2	3	4

Javob: _____

12. Berilgan funksiyalarga ularning boshlang'ich funksiyalarini mos keltiring.

Funksiyalar	Boshlang'ich funksiyalar
1. $\frac{3}{x} + \frac{2}{x^2}$	A. $-3\text{ctg}x + c$
	B. $\frac{\sqrt[3]{x^5}}{5} + c$
2. $1 - x^{-1}$	C. $\frac{\sqrt[3]{x^5}}{5} + c$
3. $\sqrt[3]{x^2}$	

4. $\frac{3}{\sin^2 x}$	D. $x - \ln x + c$
	E. $-3 \cos^2 x + c$
	F. $3 \ln x - \frac{2}{x} + c$

1	2	3	4

Javob: _____

Moda, mediana, o'rtta qiymat, korrelyatsiya	B	Bir tanlovli test	A,B,C,D
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1. Korxonada ishchilaridan tavakkaliga 20 tasi tanlanib, ularning tarif razryadlari haqida quyidagi ma'lumotlar olingan.

1, 2, 4, 6, 3, 4, 4, 2, 6, 3, 5, 3, 3, 1, 5, 4, 2, 5, 4, 3.

Shu qatorning modasini toping.

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

2. Harbiy xizmatga chaqirilgan yigitlardan 100 nafarining oyoq kiyimlari o'lchami quyidagi chastotalar jadvalida berilgan.

O'lchami	38	39	40	41	42	43	44	45
Chastota	4	4	19	27	23	14	6	3

Ma'lumotlarga ko'ra tanlanmaning o'rtta qiymatini toping.

A) 41,46 B) 41,42 C) 41,45 D) 41,43

3. Maktab basketbol jamoasi bir nechta o'yinda savatga to'p tushirib, 43, 55, 41, 42 va 37 ochko to'pladi. Jami o'yinda savatga o'rtacha necha ochkoli to'p tushirildi?

A) 43,6 B) 43,5 C) 43,4 D) 43,3

4. Korxonada ishchilaridan tavakkaliga 20 tasi tanlanib, ularning tarif razryadlari haqida quyidagi ma'lumotlar olingan.

1, 2, 4, 6, 3, 4, 4, 2, 6, 3, 5, 3, 3, 1, 5, 4, 2, 5, 4, 3.

Shu qatorning medianasini toping.

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

5. 11-sinf o'quvchilaridan 12 nafari tanlab olinib, ularning bo'ylari o'lchandi. O'lchov natijalari (cm da) 168, 159, 181, 172, 161, 163, 164, 170, 169, 154, 168, 175 bo'lsa, shu qatorning medianasini toping.

A) 164 B) 170 C) 169 D) 168

6. Statistik ma'lumotlarga ko'ra, bahor faslida yog'gan yomg'irning namligi Respublikamizning ba'zi hududlarida

13, 12, 15, 13, 18, 14, 16, 15, 15, 17

cm larda bo'lsa, shu namlikning o'rtta qiymatini toping.

A) 15,6 B) 14,8 C) 16,8 D) 15,8

7. Statistik ma'lumotlarga ko'ra, murabbiylarning ish faoliyati yil hisobida
10, 12, 18, 15, 19, 16, 21, 17, 18, 18, 12, 18, 15, 20, 16
ko'rinishdagi qatordan iborat bo'lsa, uning medianasini toping.

- A) 17,5 B) 16 C) 18 D) 17

8. Ushbu

5, 3, 5, 3, 4, 7, 4, 5, 2, 3, 5, 8, 6, 9, 6, 6, 4, 7, 8, 6, 8, 9, 6.

qatorning modasini toping.

- A) 6 B) 5 C) 5 va 6 D) 5,5

9. Iqtisodchi firma ishchilarining malaka toifalarini o'rganish uchun 20 nafarining hujjatlari asosida quyidagi statistik ma'lumotlar qatorini hosil qildi:

4; 4; 3; 2; 5; 2; 3; 5; 4; 3; 3; 2; 5; 4; 5; 4; 6; 3; 4; 5.

Shu qatorning o'rta qiymatini toping.

- A) 3,2 B) 3,6 C) 3,8 D) 3,4

10. Qatorning modasini toping.

22,4; 24,6; 23,5; 26,4; 24,9; 25,0; 23,5; 26,1; 25,3; 29,5; 23,5

- A) 23,5 B) 25,3 C) 24,6 D) 29,5

11. Ikki nafar sportchi balandlikka sakrash musobaqasida quyidagi natijalarni (cm da) ko'rsatdi:

160, 175, 142, 137, 151, 144, 169, 182, 175, 155

Uning medianasini toping.

- A) 155,5 B) 157,5 C) 160 D) 156,5

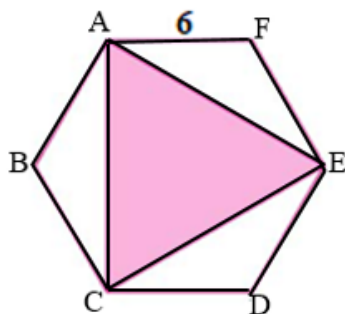
12. Qatorning modasini toping.

13, 12, 18, 15, 13, 18, 14, 16, 15, 16, 18, 14.

- A) 14 B) 16 C) 15 D) 18

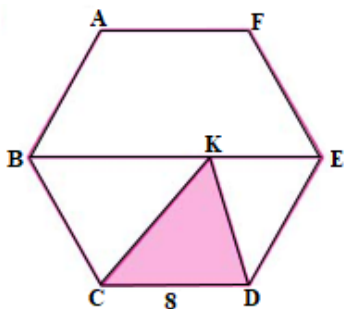
Ko'pburchaklar	B	Bir tanlovli test	A,B,C,D
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1. $ABCDEF$ muntazam oltiburchakning tomoni 6 cm ga teng bo'lsa, bo'yalgan sohaning yuzini toping ($S_{ACE} = ?$).

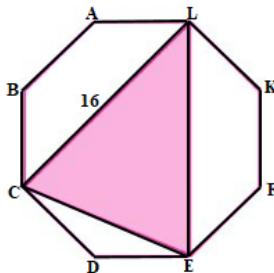


- A) $45\sqrt{3} \text{ cm}^2$ B) $27\sqrt{3} \text{ cm}^2$ C) $36\sqrt{3} \text{ cm}^2$ D) $81\sqrt{3} \text{ cm}^2$

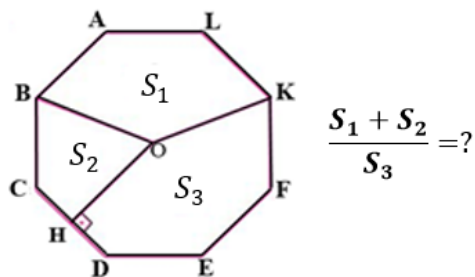
2. $ABCDEF$ muntazam oltiburchakning tomoni 8 cm ga teng bo'lsa, bo'yalgan sohaning yuzini toping ($S_{CKD} = ?$).



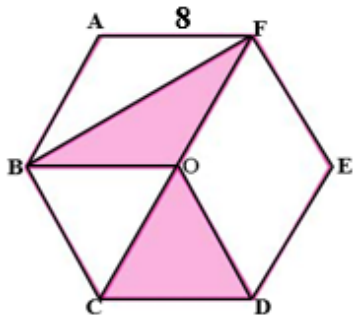
- A) $32\sqrt{3} \text{ cm}^2$ B) $24\sqrt{3} \text{ cm}^2$ C) $16\sqrt{3} \text{ cm}^2$ D) $18\sqrt{3} \text{ cm}^2$
3. $ABCDEFKL$ muntazam sakkizburchakning CL diagonali 16 cm ga teng. Bo'yalgan soha yuzini toping ($S_{LCE} = ?$).



- A) $64\sqrt{2} \text{ cm}^2$ B) $48\sqrt{2} \text{ cm}^2$ C) $16\sqrt{3} \text{ cm}^2$ D) $18\sqrt{3} \text{ cm}^2$
4. $ABCDEFKL$ muntazam sakkizburchakda O nuqta og'irlik markazi. Agar muntazam sakkizburchak $S_{ABOKL} = S_1$, $S_{BCHO} = S_2$, $S_{OHDEFK} = S_3$ yuzlarga ajratilgan va $OH \perp CD$ bo'lsa, $\frac{S_1+S_2}{S_3}$ ning qiymatini toping.

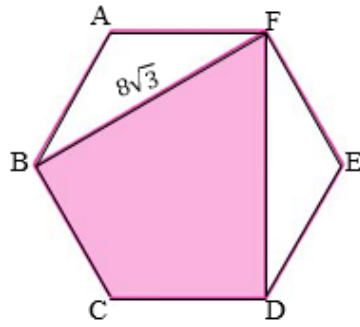


- A) $\frac{13}{3}$ B) $\frac{11}{6}$ C) $\frac{9}{7}$ D) $\frac{12}{5}$
5. $ABCDEF$ muntazam oltiburchakda O nuqta og'irlik markazi. Agar muntazam oltiburchakning tomoni 8 cm ga teng bo'lsa, bo'yalgan sohaning yuzini toping ($S_{BOF} + S_{OCD} = ?$).

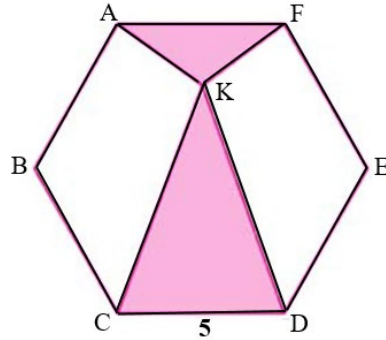


- A) $18\sqrt{3} \text{ cm}^2$ B) $24\sqrt{3} \text{ cm}^2$ C) $16\sqrt{3} \text{ cm}^2$ D) $32\sqrt{3} \text{ cm}^2$

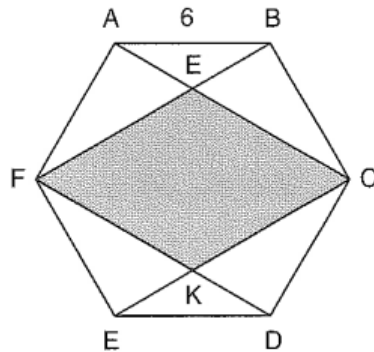
6. $ABCDEF$ muntazam oltiburchakda $BF = 8\sqrt{3}$ cm bo'lsa, bo'yalgan sohaning yuzini toping ($S_{BCDF} = ?$).



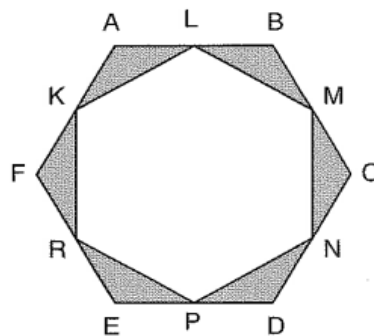
- A) $56\sqrt{3}$ cm² B) $48\sqrt{3}$ cm² C) $36\sqrt{3}$ cm² D) $64\sqrt{3}$ cm²
7. $ABCDEF$ muntazam oltiburchakning tomoni 5 cm ga teng. Bo'yalgan sohaning yuzini toping ($S_{AKF} + S_{KCD} = ?$).



- A) $10\sqrt{3}$ cm² B) $\frac{25\sqrt{3}}{2}$ cm² C) $10\sqrt{2}$ cm² D) $\frac{15\sqrt{2}}{2}$ cm²
8. $ABCDEF$ muntazam oltiburchakning tomoni 6 cm ga teng. Bo'yalgan sohaning yuzini toping ($S_{EFKC} = ?$).

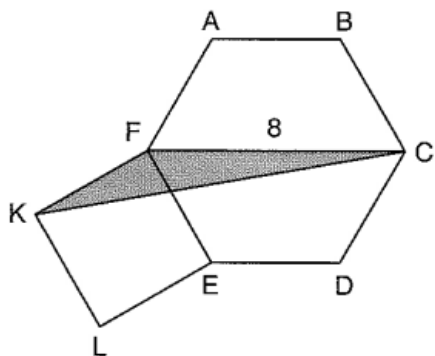


- A) $24\sqrt{3}$ cm² B) $48\sqrt{3}$ cm² C) $32\sqrt{3}$ cm² D) $16\sqrt{3}$ cm²
9. $ABCDEF$ va $KLMNPR$ muntazam oltiburchaklar. Agar $BM = MC$ va $BM = 4$ cm bo'lsa, bo'yalgan sohaning yuzini toping.

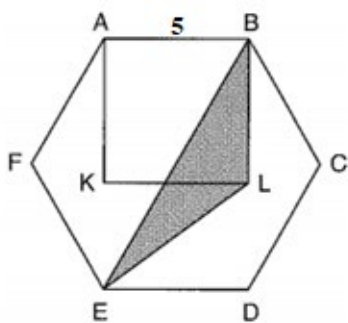


- A) $32\sqrt{3}$ cm² B) $24\sqrt{3}$ cm² C) $16\sqrt{3}$ cm² D) $8\sqrt{3}$ cm²

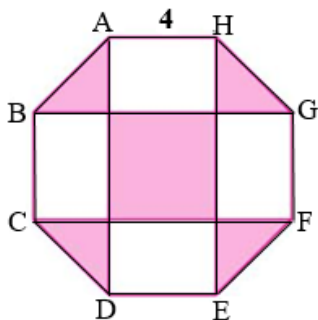
10. $ABCDEF$ muntazam oltiburchak va $FELK$ kvadrat berilgan. Agar $FC = 8$ cm bo'lsa, bo'yalgan sohaning yuzini toping.



- A) 4 cm^2 B) $4\sqrt{3} \text{ cm}^2$ C) 8 cm^2 D) $8\sqrt{3} \text{ cm}^2$
11. $ABCDEF$ muntazam oltiburchak va $AKLB$ kvadrat berilgan. Agar $AB = 5$ cm bo'lsa, bo'yalgan sohaning yuzini toping.



- A) $\frac{25\sqrt{3}}{2} \text{ cm}^2$ B) $12,5 \text{ cm}^2$ C) 25 cm^2 D) $5\sqrt{3} \text{ cm}^2$
12. Agar $ABCDEFGH$ muntazam sakkizburchakning tomoni 4 cm ga teng bo'lsa, bo'yalgan sohalarning yuzlari yig'indisini toping.



- A) 16 cm^2 B) 8 cm^2 C) 24 cm^2 D) 32 cm^2

Shar va sfera	B	Bir tanlovli test	A,B,C,D
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- Radiusi 13 cm ga teng bo'lgan shar tekislik bilan kesilgan. Agar shar markazidan kesimgacha masofa 10 cm ga teng bo'lsa, kesimning yuzini toping.
A) $69 \pi \text{ cm}^2$ B) $3\sqrt{6} \pi \text{ cm}^2$ C) $100 \pi \text{ cm}^2$ D) $9 \pi \text{ cm}^2$
- Radioslari 2 cm; 3 cm va 4 cm ga teng bo'lgan metall sharlar eritilib, bitta shar quyildi. Shu sharning hajmini toping.

- A) $144 \pi \text{ cm}^3$ B) $396 \pi \text{ cm}^3$ C) $99 \pi \text{ cm}^3$ D) $116 \pi \text{ cm}^3$
3. Kovak shar devorining hajmi $252 \pi \text{ cm}^3$ ga, devorning qalinligi 3 cm ga teng. Tashqi sharning radiusini toping.
A) 5 cm B) 6 cm C) 4 cm D) 7 cm
4. Ikkita sfera yuzlarining nisbati 2 ga teng. Bu sferalar diametrlarining nisbatini toping.
A) 2 B) 4 C) $2\sqrt{2}$ D) $\sqrt{2}$
5. Tenglamasi $x^2 + y^2 + z^2 - 4x + 10z - 35 = 0$ bo'lgan sferaning radiusi uzunligini aniqlang.
A) 5 birlik B) 6 birlik C) 7 birlik D) 8 birlik
6. Shar katta doirasining yuzi $25\pi \text{ cm}^2$ ga teng. Sharning markazidan qanday masofada o'tkazilgan tekislik shardan doirasining yuzi $9\pi \text{ cm}^2$ ga teng bo'lgan kesim ajratadi?
A) 3,8 cm B) 3,6 cm C) 3,5 cm D) 4 cm
7. Shar radiusi 6 cm ga teng. Radius uchidan u bilan 30° burchak tashkil qiluvchi tekislik o'tkazilgan. Shar bilan tekislik hosil qilgan kesimning yuzini toping.
A) $27\pi \text{ cm}^2$ B) $8\pi \text{ cm}^2$ C) $30\pi \text{ cm}^2$ D) $25\pi \text{ cm}^2$
8. Hajmi $\frac{9\pi}{16} \text{ cm}^3$ ga teng bo'lgan sharning sirti yuzini aniqlang.
A) $\frac{15\pi}{4} \text{ cm}^2$ B) $\frac{9\pi}{4} \text{ cm}^2$ C) $\frac{17\pi}{4} \text{ cm}^2$ D) $2\pi \text{ cm}^2$
9. Tomonlari 10 cm, 10 cm va 12 cm ga teng bo'lgan uchburchak shar sirtiga urinadi. Uchburchak tekisligidan shar markazigacha masofa 4 cm ga teng bo'lsa, sharning radiusini toping.
A) 5 cm B) 6 cm C) 8 cm D) 4 cm
10. Radiusi 13 cm ga teng bo'lgan shar sirtiga diagonallari 30 cm va 40 cm ga teng bo'lgan romb tomonlari urinadi. Romb tekisligidan shar markazigacha bo'lgan masofani aniqlang.
A) 7 cm B) 6 cm C) 5 cm D) 4 cm
11. Sfera sirtidagi uchta nuqta orasidagi masofa 26 cm, 24 cm va 10 cm ga, sfera sirtining yuzi esa $900\pi \text{ cm}^2$ ga teng. Shu uchta nuqta orqali o'tgan tekislikdan sferaning markazigacha bo'lgan masofani toping.
A) $\sqrt{14} \text{ cm}$ B) $2\sqrt{14} \text{ cm}$ C) $4\sqrt{14} \text{ cm}$ D) 56 cm
12. Radiusi 17 cm bo'lgan shar markazidan 8 cm masofada tekislik bilan kesilgan. Kesimning yuzini toping.
A) $128 \pi \text{ cm}^2$ B) $64\pi \text{ cm}^2$ C) $225\pi \text{ cm}^2$ D) $514\pi \text{ cm}^2$

Trigonometrik tenglamalar	Q	Bir tanlovli test	A,B,C,D
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1. $\sin 3x = \cos(x - \frac{\pi}{6})$ tenglamaning $[0; \pi]$ kesmadagi barcha yechimlari yig'indisini toping.
A) $\frac{5\pi}{6}$ B) $\frac{\pi}{6}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{3}$
2. $\sin x - \sin \frac{3x}{2} \cos \frac{x}{2} = 0$ tenglamaning $[0; \pi]$ kesmadagi turli yechimlari yig'indisini toping.

- A) $\frac{5\pi}{6}$ B) $\frac{\pi}{3}$ C) $\frac{4\pi}{3}$ D) π
3. $\cos 2x + \cos x + 1 = 0$ tenglama $[-\pi; \pi]$ kesmada nechta yechimga ega?
A) 2 B) 3 C) 5 D) 4
4. $\sin(x - \frac{\pi}{6}) + \cos(x - \frac{\pi}{6}) = 0$ tenglamaning $[0; 2\pi]$ kesmadagi yechimlari yig'indisini toping.
A) $\frac{31\pi}{6}$ B) $\frac{17\pi}{6}$ C) $\frac{5\pi}{6}$ D) $\frac{7\pi}{3}$
5. $\cos 7x - \sin 5x = \sqrt{3} \cdot (\cos 5x - \sin 7x)$ tenglamaning $0^\circ < x < 30^\circ$ oraliqdagi eng katta ildizini toping.
A) $\frac{\pi}{6}$ B) $\frac{\pi}{12}$ C) $\frac{\pi}{9}$ D) $\frac{2\pi}{15}$
6. $\frac{\cos x + \cos 3x + \cos 5x}{\sin x + \sin 3x + \sin 5x} = \frac{\sqrt{3}}{3}$ tenglamaning $0^\circ \leq x < 90^\circ$ oraliqdagi ildizlari yig'indisini toping.
A) $\frac{5\pi}{9}$ B) $\frac{7\pi}{12}$ C) $\frac{\pi}{2}$ D) $\frac{7\pi}{6}$
7. $\sin^2 x + 3x^2 \cos x + 3x^2 = 0$ tenglamaning $[0; 2\pi]$ kesmadagi ildizlari yig'indisini toping.
A) $1,5\pi$ B) 3π C) π D) 2π
8. $\sqrt{3} \sin 2x + \cos 5x = \cos 9x$ tenglamaning $[0; \frac{\pi}{2}]$ kesmadagi ildizlari nechta?
A) 2 B) 3 C) 4 D) 5
9. $\sqrt{3}(\cos x - \sin 3x) = \cos 3x - \sin x$ tenglamaning $[0; \frac{\pi}{2}]$ kesmadagi ildizlari yig'indisini toping.
A) $\frac{5\pi}{12}$ B) $\frac{5\pi}{24}$ C) $\frac{7\pi}{12}$ D) $\frac{5\pi}{8}$
10. $(\sin x + \sqrt{3} \cos x)^2 - 5 = \cos(\frac{\pi}{6} - x)$ tenglamaning $[-2\pi; 2\pi]$ kesmadagi ildizlari yig'indisini toping.
A) $\frac{\pi}{3}$ B) $\frac{4\pi}{3}$ C) $\frac{7\pi}{6}$ D) $\frac{5\pi}{6}$
11. $\sin 2x + \cos 2x + \sin x + \cos x + 1 = 0$ tenglamaning $(90^\circ; 180^\circ)$ oraliqdagi ildizlari yig'indisini toping.
A) $\frac{19\pi}{12}$ B) $\frac{7\pi}{4}$ C) $\frac{17\pi}{12}$ D) $\frac{9\pi}{4}$
12. $\sqrt{1 - \sin 2x} = \sin 3x + \cos 3x$ tenglama $[\frac{3\pi}{2}; 2\pi]$ kesmada nechta ildizga ega?
A) 4 B) 5 C) 3 D) 2

Logarifmik va ko'rsatkichli tenglamalar	Q	Bir tanlovli test	A,B,C,D
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1. $\log_3 x \cdot \log_4 x \cdot \log_5 x = \log_3 x \cdot \log_4 x + \log_4 x \cdot \log_5 x + \log_3 x \cdot \log_5 x$ tenglamaning ildizlari ko'paytmasini toping.
A) 72 B) 60 C) 64 D) 84
2. $\log_2 x + \log_3 x = \log_2 x \cdot \log_3 x$ tenglamaning ildizlari yig'indisini toping.

- A) 5 B) 6 C) 7 D) 9
3. $5\sqrt{\log_3 x} - \log_3 9x - 4 = 0$ tenglamaning kichik ildizini toping.
A) 93 B) 54 C) 81 D) 27
4. $\log_2 \log_3(x^2 - 16) - \log_{\frac{1}{2}} \log_{\frac{1}{3}}\left(\frac{1}{x^2 - 16}\right) = 2$ tenglamaning ildizlari ko'paytmasini toping.
A) 36 B) 48 C) -24 D) -25
5. $\lg \lg(x - 1) = \lg \lg(2x + 1) - \lg 2$ tenglamaning ildizini toping.
A) 4 B) 8 C) 10 D) 16
6. Tenglamani yeching: $\log_4 \log_2 x + \log_2 \log_4 x = 2$
A) 8 B) 16 C) 32 D) 4
7. Tenglamani yeching: $2^{3x} - 8 \cdot 2^{-3x} - 6 \cdot \left(2^x - \frac{1}{2^{x-1}}\right) = 1$
A) 1 B) 2 C) 4 D) 0
8. $\sqrt[x]{81} - \sqrt[x]{9^{x+1}} + 18 = 0$ tenglamaning ildizlari ko'paytmasini toping.
A) $2 \log_2 9$ B) $\log_9 16$ C) $2 \log_6 9$ D) $\log_3 36$
9. Tenglamani yeching: $(x - 3)^{3x^2 - 10x + 3} = 1$
A) faqat 4 B) 4 va $\frac{1}{3}$ C) $\frac{1}{3}$ va 3 D) faqat $\frac{1}{3}$
10. Tenglamani yeching: $6^{2x+4} = 3^{3x} \cdot 2^{x+8}$
A) 8 B) 12 C) 6 D) 4
11. $2^x \cdot x^2 - 2x^2 + 2 - 2^x = 0$ tenglama ildizlarining ko'paytmasini toping.
A) 16 B) -1 C) 4 D) 2
12. Tenglamani yeching: $4 \cdot 9^{2x} - 3 \cdot 4^{2x} - 4 \cdot 36^x = 0$
A) 2 B) 0,5 C) 4 D) 0,25

Trigonometrik tengsizliklar	Q	Qisqa javobli	Javob: _____
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1. Ushbu $|1 + \sin x| \leq \frac{1}{2}$ tengsizlikning $[0; 2\pi]$ kesmadagi eng katta va eng kichik yechimlari ayirmasini toping.

Javob: _____

2. Tengsizlikni yeching: $1 - 2\sin 4x < \cos^2 4x$

Javob: _____

3. $-1 - \frac{2}{\sqrt{3}} \cos x > 0$ tengsizlik $[-\pi; \pi]$ kesmada nechta butun yechimga ega?

Javob: _____

4. $2\cos^2 x - 1 \leq \frac{1}{2}$ tengsizlikning $[0; \pi]$ kesmadagi eng kichik va eng katta yechimlari yig'indisini toping.

Javob: _____

5. Tengsizlikni yeching: $1 - 2\cos 2x > \sin^2 2x$

Javob: _____

6. $\sin(2x + \frac{\pi}{3}) < -\frac{1}{2}$ tengsizlikni $[0; \pi]$ kesmadagi yechimlarini toping.

Javob: _____

7. Tengsizlikni yeching: $\sin^2 3x - \cos^2 3x \leq -\frac{\sqrt{3}}{2}$

Javob: _____

8. x ning $(-\pi; \pi)$ oraliqqa tegishli qanday qiymatlarida $|\cos x + 2,5| \geq 3$ tengsizlik o'rinli bo'ladi?

Javob: _____

9. $\cos^2 x < \frac{\sqrt{2}}{2} + \sin^2 x$ tengsizlikni $[0; \pi]$ kesmadagi yechimlarini toping.

Javob: _____

10. Tengsizlikni yeching: $4\sin^2 x + \sin^2 2x < 3$

Javob: _____

11. Tengsizlikni yeching: $\cos x > \sin^2 x - \cos^2 x$

Javob: _____

12. $\sin x - \sqrt{3}\cos x > \sqrt{2}$ tengsizlikni $[0; 2\pi]$ kesmadagi yechimlarini toping.

Javob: _____

Logarifmik va ko'rsatkichli tengsizliklar	Q	To'la yechimli	Asoslangan yechim va javobni keltirish
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1. $\frac{(\sqrt{5})^{x-10}}{4^{x-10}} > \frac{5\sqrt{5}}{64}$ tengsizlikning eng katta butun yechimini toping.

Javob: _____

2. $15 \cdot 2^{2-2x} + 19 \cdot 2^{-x} > 2$ tengsizlikning eng katta butun yechimini toping.

Javob: _____

3. $8^{\frac{2x^2+1}{x}} \leq 0,5 \cdot 4^{3x}$ tengsizlikning butun yechimlari sonini toping.

Javob: _____

4. Tengsizlikni yeching: $2^{x+2} - 2^{x+3} - 2^{x+4} > 5^{x+1} - 5^{x+2}$.

Javob: _____

5. Tengsizlikni yeching: $4 \cdot 3^{x+2} - 2 \cdot 5^{x+2} \leq 5^{x+3} - 3^{x+3}$.

Javob: _____

6. $4^{\sqrt{x}} - 2^{\sqrt{x}+1} < 2^{\sqrt{x}+4} - 32$ tengsizlikning butun yechimlarining o'рта arifmetik qiymatini toping.

Javob: _____

7. Tengsizlikni yeching: $\log_{0,2}(x^2 - x - 20) + \log_5(x + 4) > 0$

Javob: _____

8. $\log_{\frac{1}{2}}(4 - x) \geq \log_{\frac{1}{2}} 2 - \log_{\frac{1}{2}}(x - 1)$ tengsizlikning eng katta butun yechimini toping.

Javob: _____

9. Tengsizlikni yeching: $\log_{\frac{1}{2}}^2(4 - x) + 10 \log_{\frac{1}{2}}(4 - x) + 25 \leq 0$

Javob: _____

10. $\log_{0,5}(x^2 - 3x + 4) - \log_{0,5}(x - 1) < -1$ tengsizlikning eng kichik butun yechimini toping.

Javob: _____

11. $\log_{\frac{1}{3}}(x + 2) - \log_9(x + 2) > -\frac{3}{2}$ tengsizlikning butun yechimlari yig'indisini toping.

Javob: _____

12. Tengsizlikni yeching: $\log_{\frac{1}{2}}(x - \frac{1}{2}) - \log_2(x - 1) \geq 1$

Javob: _____

Hosila yordamida yechiladigan masalalar	Q	Qisqa javobli	Javob: _____
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1. Ikki moddiy nuqta $S_1(t) = 2t^3 - 5t^2 - 3t$ va $S_2(t) = 2t^3 - 3t^2 - 11t + 7$ qonuniyatlar bo'yicha harakatlanayapdi (S_1 va S_2 - metr hisobida, t - sekund hisobida). Bu ikki nuqtaning tezliklari teng bo'lgan paytda birinchi nuqtaning tezlanishini toping.

Javob: _____

2. Ushbu $S(t) = 4t^2 - \frac{t^3}{3}$ qonuniyat bilan harakatlanayotgan jismning eng katta tezligini aniqlang. (Bunda S - metr hisobida, t - sekund hisobida.)

Javob: _____

3. Moddiy nuqta to'g'ri chiziq bo'ylab $S(t) = -\frac{1}{12}t^4 + \frac{2}{3}t^3 + \frac{3}{2}t^2$ qonuniyat bo'yicha harakatlanayapdi (S - metr hisobida, t - sekund hisobida). Harakat boshlangandan qancha sekund o'tgach, uning tezlanishi eng katta bo'ladi?

Javob: _____

4. Ikki moddiy nuqta $S_1(t) = 2,5t^2 - 6t + 1$ va $S_2(t) = 0,5t^2 + 2t - 3$ qonuniyat bo'yicha harakatlanayapdi (S_1 va S_2 - metr hisobida, t - sekund hisobida). Qaysi vaqtda birinchi nuqtaning tezligi ikkinchisidan uch marta ko'p bo'lishi mumkin?

Javob: _____

5. $f(x) = x^3 - x - 1$ va $g(x) = 3x^2 - 4x + 1$ egri chiziq'larga o'tkazilgan urinmalar parallel bo'ladigan nuqtalarni toping. Shu urinmalarning tenglamalarini yozing.

6. To'g'ri prizmaning asosi teng yonli to'g'ri burchakli uchburchakdan iborat, uning katta yon yog'ining perimetri 24 cm ga teng. Prizmaning hajmi eng katta bo'lishi uchun uning asosining tomonlari qanday uzunliklarga ega bo'lishi kerak?

Javob: _____

7. $f(x) = x^3 - 2x^2 + 4$ va $g(x) = x^3 - \ln x$ egri chiziq'larga o'tkazilgan urinmalar parallel bo'ladigan nuqtalarni toping. Shu urinmalarining tenglamalarini yozing.

Javob: _____

8. h_0 balandlikdan v_0 boshlang'ich tezlik bilan yuqoriga tik otilgan jism

$h(t) = h_0 + v_0 \cdot t - \frac{gt^2}{2}$ qonun bo'yicha harakat qilmoqda. Agar $h_0 = 5$ m, $v_0 = 2,5$ m/s, $g \approx 10$ m/s² bo'lsa, jismning tezligi v_0 tezligidan 5 marta kichik bo'lgan vaqt paytidagi balandligini toping.

Javob: _____

9. Nuqtaning koordinatalar to'g'ri chizig'i bo'ylab harakat qonuni $x = 2 + 10t - 0,3t^2$ (m) tenglama bilan ifodalanadi. Nuqtaning $t_0 = 6$ (s) momentdagi tezligini toping. Harakat qachon to'xtaydi?

Javob: _____

10. To'g'ri to'rtburchakli parallelepipedning balandligi asosining diagonaliga teng, asosining yuzi esa 4 m². Asosining tomonlari va balandligi qanday ununlikda tanlansa, parallelepipedning hajmi eng kichik bo'ladi?

Javob: _____

11. To'rtburchakli muntazam piramidaning apofemasi $2\sqrt{3}$ ga teng, balandligi esa $[1; 3]$ kesmaga tegishli istalgan qiymatni qabul qiladi. Piramidaning eng katta hajmini toping.

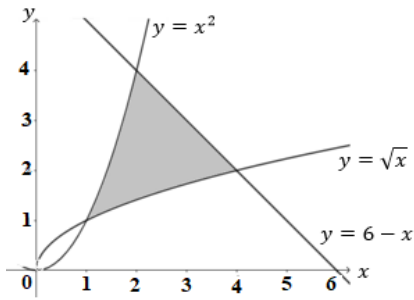
Javob: _____

12. To'g'ri chiziq bo'ylab harakatlanayotgan moddiy nuqtaning tezligi $v(t) = \ln t - \frac{1}{8}t$ (m/s) qonuniyat bo'yicha o'zgaradi. Vaqtning qanday onida (sekund) nuqtaning tezlanishi nolga teng bo'ladi?

Javob: _____

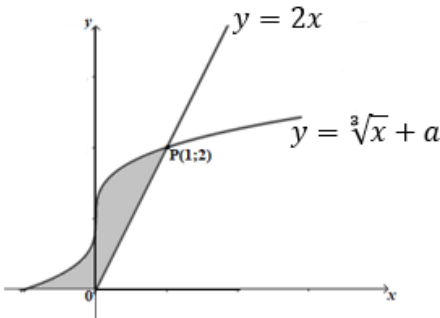
Integral: integrallash usullari, aniq integral (integraldagi funksiyani soddalashtirish lozim bo'lgan), shakl yuzini topish	Q	To'la yechimli	Asoslangan yechim va javobni keltirish
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1. Chizmada $y = x^2$, $y = \sqrt{x}$ egri chiziq'lar va $y = 6 - x$ to'g'ri chiziq grafiklari berilgan. Bo'yalgan sohaning yuzini toping.



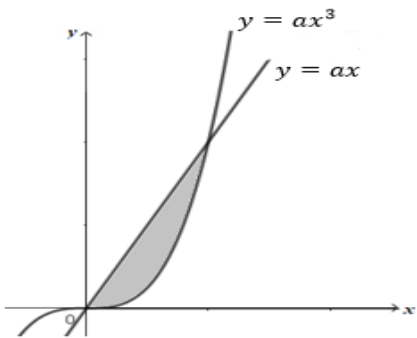
Javob: _____

2. Chizmada $y = \sqrt[3]{x} + a$ egri chiziq va $y = 2x$ to'g'ri chiziqning grafigi berilgan. Agar funksiyalar $P(1; 2)$ nuqtada kesishishi ma'lum bo'lsa, bo'yalgan sohaning yuzini toping.



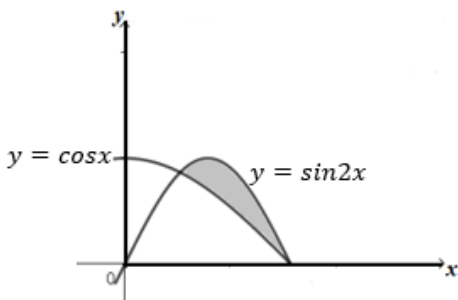
Javob: _____

3. Chizmada $y = ax^3$ egri chiziq va $y = ax$ to'g'ri chiziq grafiglari berilgan. Agar bo'yalgan sohaning yuzi 1 kvadrat birlikka teng bo'lsa, a ning qiymatini toping.



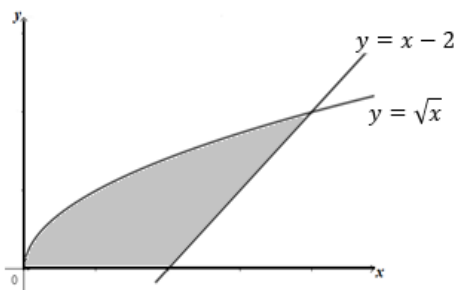
Javob: _____

4. Chizmada $y = \cos x$ va $y = \sin 2x$ funksiya grafiglari berilgan. Bo'yalgan sohaning yuzini toping.



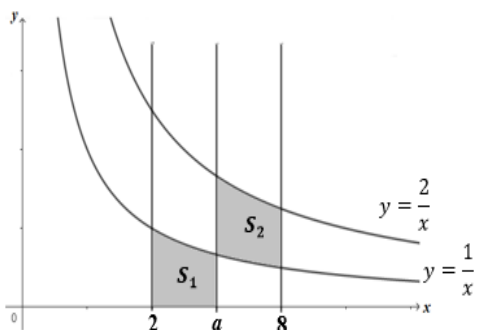
Javob: _____

5. Chizmada $y = x - 2$ to'g'ri chiziq va $y = \sqrt{x}$ egri chiziq grafigi berilgan. Bo'yalgan sohaning yuzini toping.



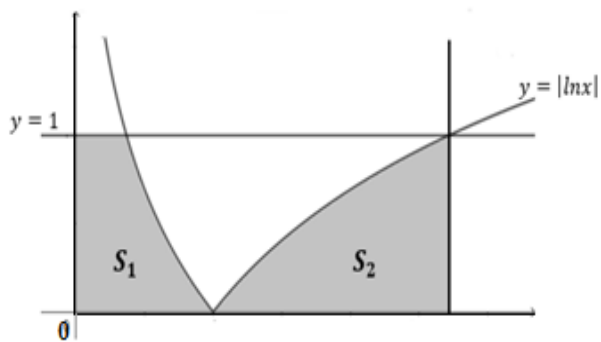
Javob: _____

6. Chizmada $y = \frac{2}{x}$, $y = \frac{1}{x}$ egri chiziq hamda $x = 2$, $x = 8$ va $x = a$ to'g'ri chiziqlar orasidagi bo'yalgan sohalarning S_1 va S_2 yuzlari berilgan. Agar $S_1 = S_2$ bo'lsa, a ning qiymatini toping.



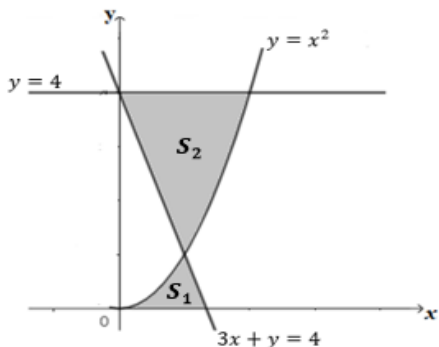
Javob: _____

7. Chizmada $y = |\ln x|$ egri chiziq va $y = 1$ to'g'ri chiziq berilgan. Berilganlardan foydalanib, $S_2 - S_1$ ning qiymatini toping.



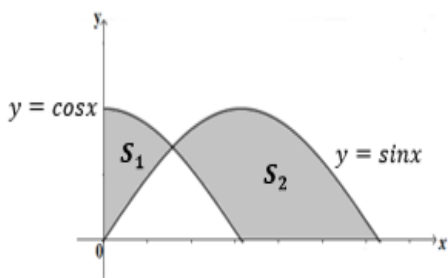
Javob: _____

8. Chizmada $y = x^2$ parabola hamda $3x + y = 4$ va $y = 4$ to'g'ri chiziqlarning grafigi berilgan. Berilganlardan foydalanib, $S_2 - S_1$ ning qiymatini toping.



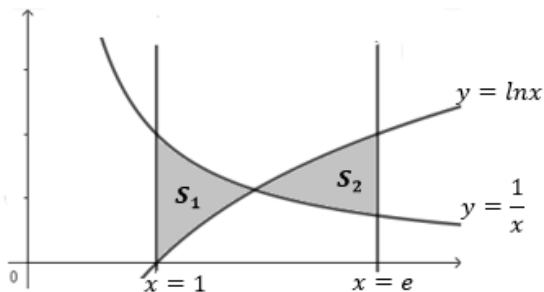
Javob: _____

9. Chizmada $y = \sin x$ va $y = \cos x$ funksiyalarning grafigi berilgan. Agar bo'yalgan sohalarining yuzlari S_1 va S_2 ga teng bo'lsa, $S_2 - S_1$ ning qiymatini toping.



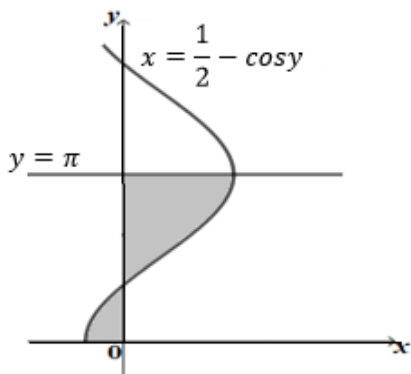
Javob: _____

10. Chizmada $y = \ln x$ va $y = \frac{1}{x}$ egri chiziqlar, $x = 1$ hamda $x = e$ to'g'ri chiziq grafiglari berilgan. Agar bo'yalgan sohalarining yuzlari S_1 va S_2 ga teng bo'lsa, $S_1 - S_2$ ayirmaning qiymatini toping.



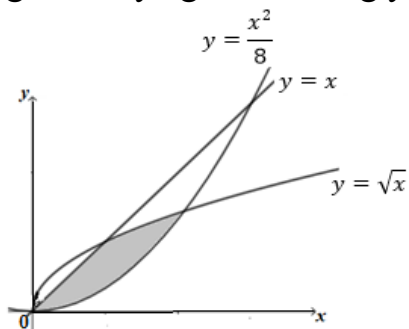
Javob: _____

11. Chizmada $x = \frac{1}{2} - \cos y$ egri chiziq va $y = \pi$ to'g'ri chiziq grafigi berilgan. Berilganlardan foydalanib bo'yalgan sohaning yuzini toping.



Javob: _____

12. Chizmada $y = \sqrt{x}$ va $y = \frac{x^2}{8}$ egri chiziqlar hamda $y = x$ to'g'ri chiziq grafiglari berilgan. Bo'yalgan sohaning yuzini toping.



Javob: _____

Binomial topish	koeffitsiyentlarni	Q	Qisqa javobli	Javob: _____
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1. Ushbu $\left(a\sqrt{a} + \frac{1}{a^4}\right)^n$ ko'phad yoyilmasining uchinchi hadi koeffitsiyenti, ikkinchi hadi koeffitsiyentidan 44 ga katta bo'lsa, n ning qiymatini toping.

Javob: _____

2. Agar $\left(\sqrt[13]{a} + \frac{a}{\sqrt{a-1}}\right)^m$ ko'phad uchun, $C_m^3 : C_m^2 = 4:1$ tenglik o'rinli bo'lsa, binom yoyilmasining ikkinchi hadini toping.

Javob: _____

3. Berilgan $\left(z^2 + \frac{1}{z}\sqrt[3]{z}\right)^n$ yoyilmaning binomial koeffitsiyentlar yig'indisi 2048 ga teng bo'lsa, uning to'rtinchi hadini toping.

Javob: _____

4. Ushbu $\left(\sqrt[3]{2} + \frac{1}{\sqrt[3]{3}}\right)^x$ yoyilmaning boshidan va oxiridan yettinchi hadlarining nisbati $\frac{1}{6}$ ga teng bo'lsa, x ning qiymatini toping.

Javob: _____

5. Agar $\left(\sqrt[3]{x} + \frac{1}{x}\right)^n$ yoyilmaning beshinchi hadi x ga bog'liq bo'lmasa, A_n^2 ni hisoblang.

Javob: _____

6. Ushbu $\left(x^2 - \frac{2}{x}\right)^m$ yoyilmaning birinchi uchta hadining koeffitsiyentlari yig'indisi 97 ga teng. Uning x^4 qatnashgan hadini toping.

Javob: _____

7. Agar $\left(\sqrt{x} + \frac{1}{\sqrt{x^2}}\right)^n$ binom yoyilmasida beshinchi va uchinchi hadlar koeffitsiyentlari nisbati 7:2 ga teng bo'lsa, x ning darajasi 1 ga teng bo'lgan hadini toping.

Javob: _____

8. x ning qanday qiymatlarida $\left(\sqrt{x^{1/(1+\lg x)}} + \sqrt[12]{x}\right)^6$ yoyilmaning to'rtinchi qo'shiluvchisi 200 ga teng bo'ladi.

Javob: _____

9. Agar $\left(x^2 + \frac{1}{x}\right)^m$ yoyilma birinchi uchta hadining, binomial koeffitsiyentlari yig'indisi 46 ga teng bo'lsa, uning x qatnashmagan hadini toping.

Javob: _____

10. Agar $\left(\sqrt{2^x} + \frac{1}{\sqrt{2^{x-1}}}\right)^m$ yoyilmaning uchinchi va beshinchi qo‘shiluvchilari yig‘indisi 135 ga, oxirgi uchta binomial koeffitsiyentlar yig‘indisi 22 ga teng bo‘lsa, x ning qiymatini toping.

Javob: _____

11. x ning qanday qiymatlarida $(x + x^{\lg x})^5$ yoyilmaning uchinchi hadi 1000000 ga teng bo‘ladi?

Javob: _____

13. Agar $\left(2^x + \frac{1}{4^x}\right)^n$ yoyilmaning ikkinchi va uchinchi binomial koeffitsiyentlari yig‘indisi 36 ga, uchinchi hadi, ikkinchi hadidan 7 marta katta bo‘lsa, x ning qiymatini toping.

Javob: _____

Hodisalar ustida amallar	Q	Qisqa javobli	Javob: _____
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1. Elektr zanjiriga erkli (mustaqil) ishlaydigan 3 ta element ketma – ket ulangan. Birinchi, ikkinchi va uchinchi elementlarning buzilish ehtimolliklari mos ravishda $p_1 = 0,1$; $p_2 = 0,15$; $p_3 = 0,2$ ga teng. Zanjirda elektr tok bo‘lmasligi ehtimolligini toping.

Javob: _____

2. Birinchi idishda 2 ta oq va 3 ta qora, ikkinchisida esa 1 ta oq va 4 ta qora shar bor. Birinchi idishdan tavakkaliga 2 ta shar olib, ikkinchisiga solingandan so‘ng, ikkinchi idishdan tavakkaliga olingan bitta sharning oq shar ekanligi ehtimolligini toping.

Javob: _____

3. Ikki detal bir – biridan mustaqil holatda nazoratdan o‘tkazilmoqda. Birinchi detalning yaroqsiz chiqmaslik ehtimolligi 0,7 ga, ikkinchisidiki 0,8 ga teng. Ikkala detalning bittasi yaroqsiz chiqmaslik ehtimolligini toping.

Javob: _____

4. Nishonga bo‘g‘liqsiz ravishda to‘rt marta o‘q uzilgan. Otuvchining har otishida nishonga tegish ehtimolligi 0,6 ga teng. Oldingi uch otishda nishonga tekkiza olmaslik va to‘rtinchi otishda nishonga tekkizish ehtimolligini toping.

Javob: _____

5. Anvar telefonda o‘rtog‘ining raqamini terayotgan edi, lekin oxirgi ikki raqamni unutib qo‘yadi va faqat bu raqamlar turlicha ekanligini eslab qolgan holda ularni tavakkaliga teradi. Kerakli raqamlar terilgan bo‘lish ehtimolligini toping.

Javob: _____

6. Ikki ovchi bo'riga qarata bittadan o'q uzishdi. Birinchi ovchining bo'riga tegizish ehtimoli 0,7 ga, ikkinchisniki esa 0,8 ga teng. Hech bo'lmaganda bitta o'qning bo'riga tegishi ehtimolligini toping.

Javob: _____

7. Texnik nazorat bo'limi buyumlarning yaroqliligini tekshiradi. Buyumning yaroqli bo'lish ehtimolligi 0,9 ga teng. Tekshirilgan ikkita buyumdan faqat bittasi yaroqli bo'lishi ehtimolligini toping.

Javob: _____

8. Guruhda 12 ta o'quvchi bo'lib, ularning 7 nafari a'lochilar. Ixtiyoriy 4 ta o'quvchi ma'naviyat xonasiga chaqirtirildi. Ularning 3 nafari a'lochi o'quvchilar bo'lishi ehtimolligini toping.

Javob: _____

9. Uchta to'pdan otishda snaryadning nishonga tegishi ehtimolligi mos ravishda $p_1 = 0,3$; $p_2 = 0,5$; $p_3 = 0,8$. Nishon yakson qilinishi uchun bitta snaryadning tegishi kifoya bo'lsa, uchta to'pdan bir yo'la otishda nishonning yakson qilinishi ehtimolini toping.

Javob: _____

10. Avariya yuz berganligi haqida signal berish uchun ikkita erkli(mustaqil) ishlaydigan signalizator o'rnatilgan. Avariya yuz berganida signalizator ishlay boshlash ehtimolligi birinchisi uchun 0,95 ga, ikkinchisi uchun 0,9 ga teng. Avariya yuz berganida faqat bitta signalizator ishlay boshlash ehtimolligini toping.

Javob: _____

11. Basketbolchining to'pni to'rga tushirish ehtimolligi 0,6 ga teng. U to'pni 4 marta tashlagan. To'pning to'rga rosa 2 marta tushishi ehtimolligini toping.

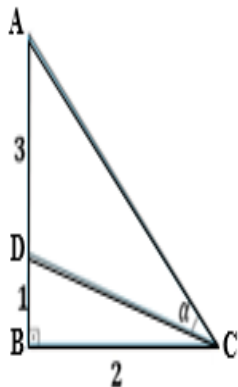
Javob: _____

12. Biror fizik kattalikni bir marta o'lchashda berilgan aniqlikdan ortiq xatoga yo'l qo'yish ehtimolligi 0,3 ga teng. Uchta mustaqil o'lchash o'tkazilgan. Bulardan faqat bittasida yo'l qo'yilgan xato berilgan aniqlikdan ortiq bo'lishi ehtimolligini toping.

Javob: _____

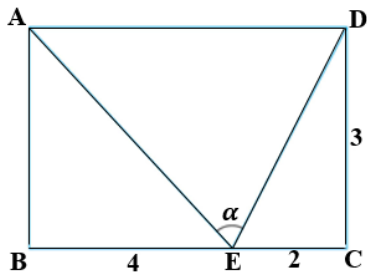
Sinuslar va kosinuslar teoremlari	Q	To'la yechimli	Asoslangan yechim va javobni keltirish
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1. ABC – to'ri burchakli uchburchak. Agar $AD = 3$ cm, $BD = 1$ cm, $BC = 2$ cm va $\angle ABC = 90^\circ$ bo'lsa, $\angle DCA = \alpha$ burchak kosinusini toping ($\cos \alpha = ?$).



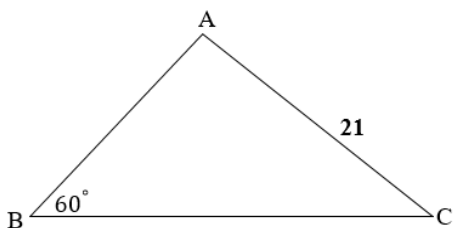
Javob: _____

2. $ABCD$ – to'g'ri to'rtburchak. Agar $BE = 4$ cm, $EC = 2$ cm, $CD = 3$ cm bo'lsa, $\angle AED = \alpha$ burchak tangensini toping ($\tan \alpha = ?$).



Javob: _____

3. ABC uchburchakning AC tomon uzunligi 21 cm ga teng. Agar $AB : BC = 3 : 8$ va $\angle ABC = 60^\circ$ bo'lsa, uchburchakning perimetrini toping.

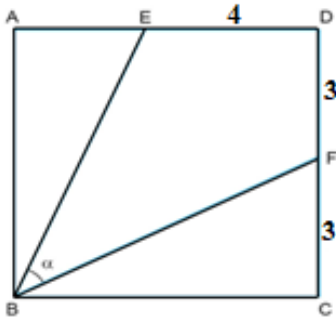


Javob: _____

4. Teng tomonli ABC uchburchakning tomoni 3 cm ga teng. CB tomondan olingan N nuqta shu tomonni 1:2 nisbatda bo'radi. AN kesma uzunligini toping.

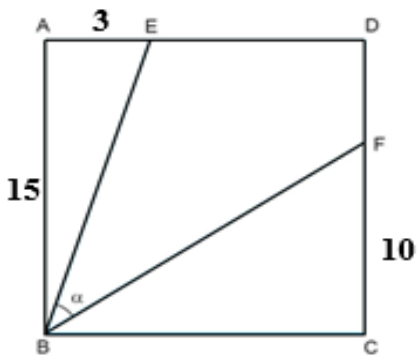
Javob: _____

5. $ABCD$ – kvadrat. Agar $ED = 4$ cm, $DF = 3$ cm, $FC = 3$ cm bo'lsa, $\angle EBF = \alpha$ burchak sinusini toping ($\sin \alpha = ?$).



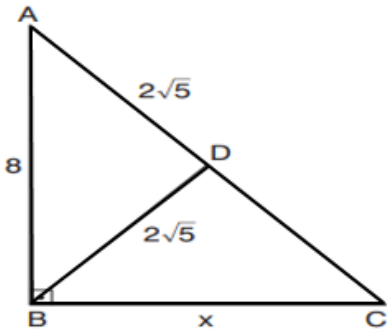
Javob: _____

6. $ABCD$ – kvadrat. Agar $AE = 3$ cm, $FC = 10$ cm, $AB = 15$ cm bo'lsa, $\angle EBF = \alpha$ burchakni toping ($\alpha = ?$).



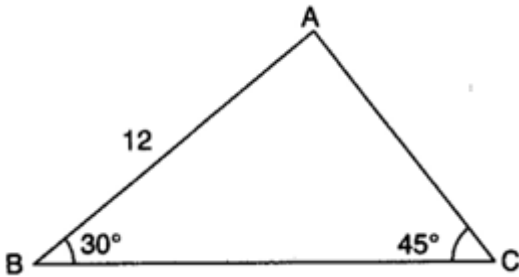
Javob: _____

7. ABC to'g'ri burchakli uchburchakda $AB \perp BC$, $AD = BD = 2\sqrt{5}$ cm va $AB = 8$ cm bo'lsa, BC tomonining uzunligini toping ($x = ?$).



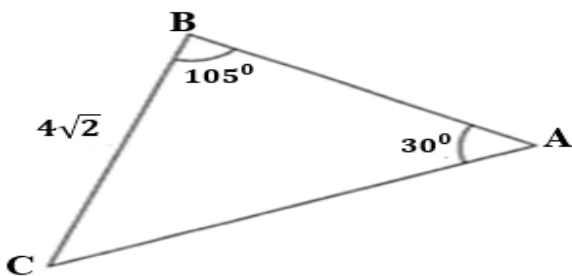
Javob: _____

8. ABC uchburchakning AB tomoni 12 cm, $\angle ABC = 30^\circ$ va $\angle BCA = 45^\circ$ bo'lsa, ABC uchburchakning yuzini toping ($S_{ABC} = ?$).



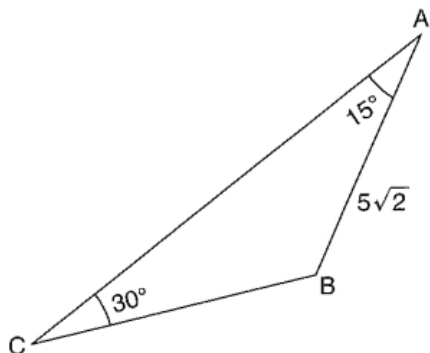
Javob: _____

9. ABC uchburchakning BC tomoni $4\sqrt{2}$ cm, $\angle ABC = 105^\circ$ va $\angle BAC = 30^\circ$ bo'lsa, ABC uchburchakning yuzini toping ($S_{ABC} = ?$).



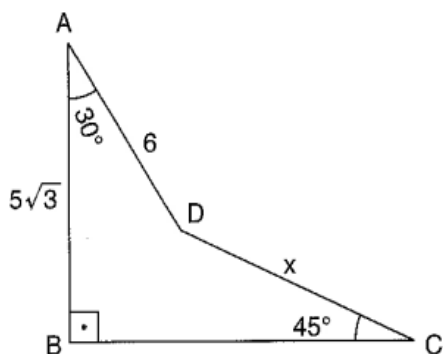
Javob: _____

10. ABC uchburchakning AB tomoni $5\sqrt{2}$ cm, $\angle BAC = 15^\circ$ va $\angle BCA = 30^\circ$ bo'lsa, ABC uchburchakning yuzini toping ($S_{ABC} = ?$).



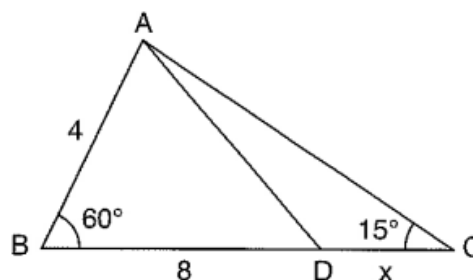
Javob: _____

11. Chizmada $AB \perp BC$, $\angle BAD = 30^\circ$, $\angle DCB = 45^\circ$ va $AD = 6$ cm bo'lsa, DC kesma uzunligini toping ($x = ?$).



Javob: _____

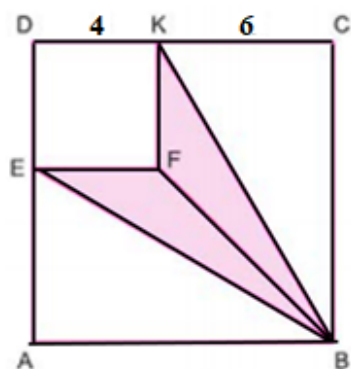
12. ABC uchburchakning AB tomoni 4 cm, $BD = 8$ cm, $\angle ACB = 15^\circ$ va $\angle ABC = 60^\circ$ bo'lsa, DC kesma uzunligini toping ($x = ?$).



Javob: _____

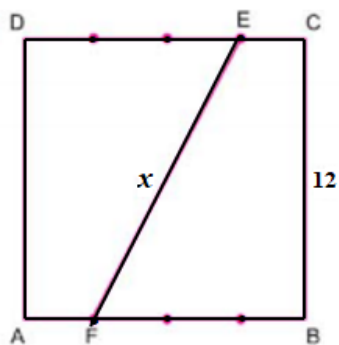
To'rtburchaklar	Q	Qisqa javobli	Javob: _____
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1. $ABCD$ va $EFKD$ kvadratlar bo'lsa, bo'yalgan soha yuzini toping. (Bunda $DK = 4$ cm, $KC = 6$ cm.)



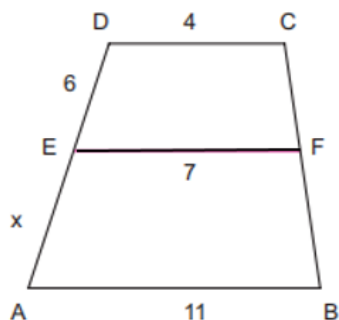
Javob: _____

2. $ABCD$ tomoni 12 cm ga teng bo'lgan kvadrat bo'lib DC va AB tomonlari 4 ta teng qismga bo'lingan. EF kesma uzunligini toping.



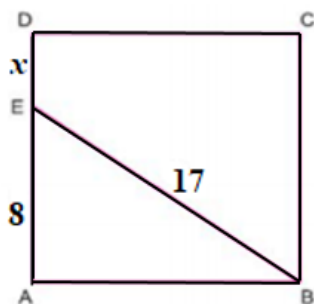
Javob: _____

3. $ABCD$ ixtiyoriy trapetsiyaning DC va AB asoslari mos ravishda 4 cm va 11 cm. Trapetsiyadan asoslariga parallel qilib uzunligi 7 cm bo'lgan EF kesma o'tkazildi. EA kesma uzunligini toping. (Bunda $DE = 6$ cm.)



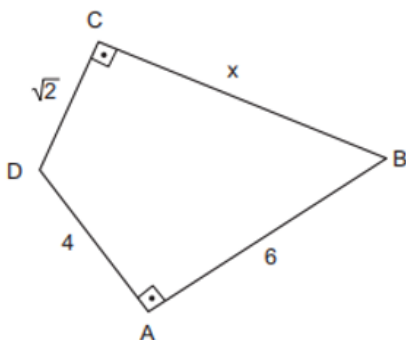
Javob: _____

4. Agar $ABCD$ kvadrat bo'lsa x ning qiymatini toping.
(Bunda $EA = 8 \text{ cm}$, $BE = 17 \text{ cm}$, $DE = x = ?$.)



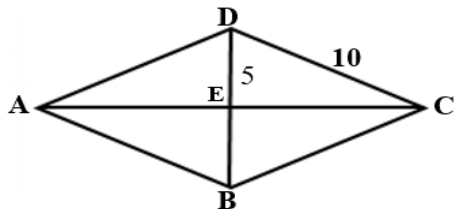
Javob: _____

5. Rasmdagi ma'lumotlardan foydalanib x ning qiymatini toping. (Bunda $AB \perp AD$, $DC \perp BC$, $DC = \sqrt{2} \text{ cm}$, $AD = 4 \text{ cm}$, $AB = 6 \text{ cm}$, $BC = x = ?$)



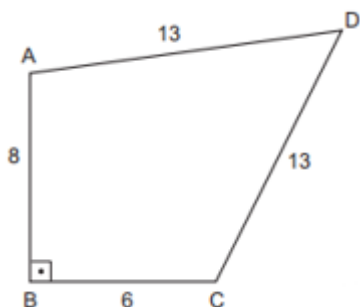
Javob: _____

6. Rasmdagi ma'lumotlar asosida $ABCD$ rombning yuzini toping.
(Bunda $DC = 10 \text{ cm}$, $DB = 5 \text{ cm}$.)



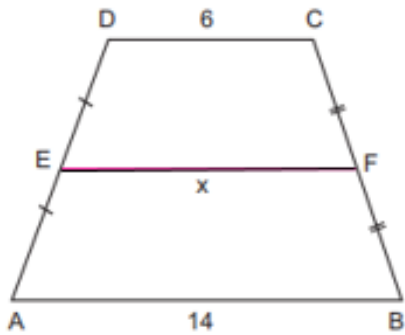
Javob: _____

7. Rasmdagi ma'lumotlar asosida $ABCD$ to'rtburchakning yuzini hisoblang.
(Bunda $AB \perp BC$, $AB = 8 \text{ cm}$, $BC = 6 \text{ cm}$, $AD = DC = 13 \text{ cm}$.)



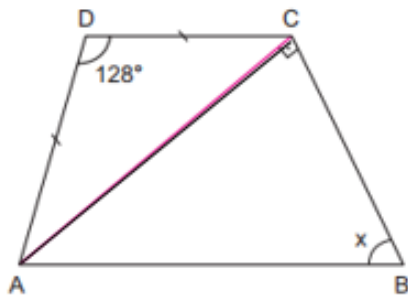
Javob: _____

8. Rasmda berilgan ma'lumotlar asosida x ning qiymatini toping. (Bunda $DC \parallel AB$, $DE = EA$, $CF = FB$, $DC = 6 \text{ cm}$, $AB = 14 \text{ cm}$, $EF = x = ?$)



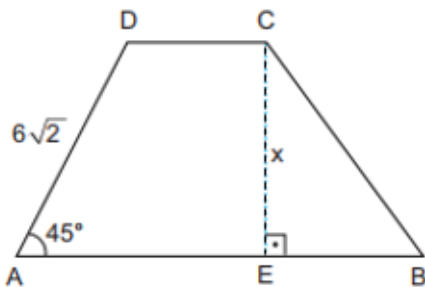
Javob: _____

9. Berilgan ma'lumotlardan foydalanib x ning qiymatini toping.
(Bunda $DC \parallel AB$, $AC \perp BC$, $AD = DC$, $\angle ABC = x = ?$)



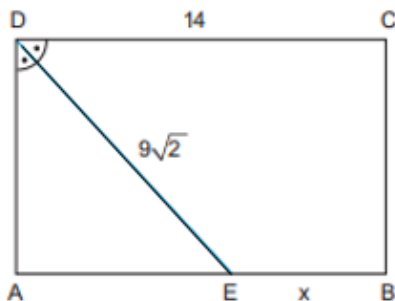
Javob: _____

10. Asoslari DC va AB bo'lgan $ABCD$ trapetsiya berilgan. Chizmadagi ma'lumotlar asosida x ning qiymatini toping. (Bunda $AD = 6\sqrt{2}$ cm, $\angle DAB = 45^\circ$, $CE = x = ?$)



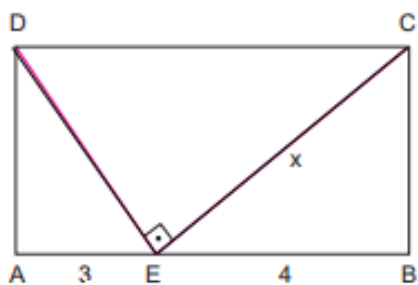
Javob: _____

11. $ABCD$ to'g'ri to'rtburchak berilgan. Chizmadagi ma'lumotlar asosida x ning qiymatini toping. (Bunda $DC = 14$ cm, $DE = 9\sqrt{2}$ cm, $\angle ADE = \angle CDE$, $EB = x = ?$)



Javob: _____

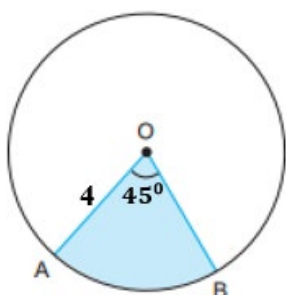
12. $ABCD$ to'g'ri to'rtburchak berilgan. Rasmdagi ma'lumotlar asosida x ning qiymatini toping. (Bunda $AE = 3$ cm, $EB = 4$ cm, $\angle DEC = 90^\circ$, $CE = x = ?$)



Javob: _____

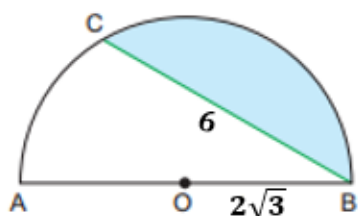
Aylana va doira	Q	Qisqa javobli	Javob: _____
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1. Berilgan ma'lumotlar asosida bo'yalgan soha yuzini hisoblang.



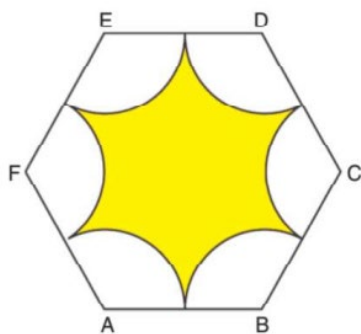
Javob: _____

2. Berilgan ma'lumotlar asosida bo'yalgan soha yuzini toping.



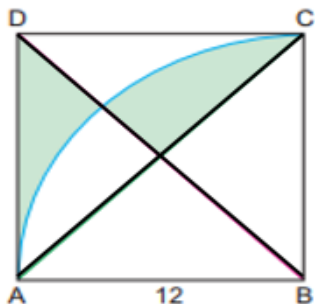
Javob: _____

3. Chizmada ABCDEF muntazam oltiburchakning har br uchini markaz qilib doira bo'laklari berilgan. Agar muntazam oltiburchakning tomoni 4 cm ga teng bo'lsa, bo'yalgan soha yuzi toping.



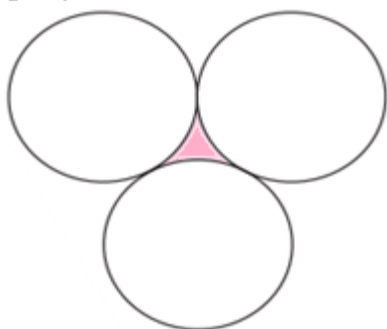
Javob: _____

4. Chizmada tomoni 12 cm bo'lgan ABCD kvadrat va markazi B nuqtada bo'lgan chorak doira berilgan. Bo'yalgan soha yuzini toping.



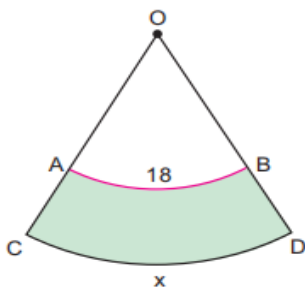
Javob: _____

5. Chizmadagi 3 ta aylananing radiuslari bir xil va $2\sqrt{3}$ ga teng. Bo'yalgan sohaning yuzini toping.



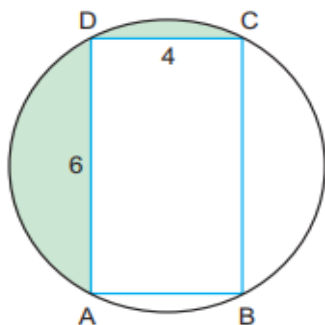
Javob: _____

6. $|OA| = 3|AC|$ va $\overline{AB} = 18\text{cm}$ bo'lsa, x ning qiymatini toping.



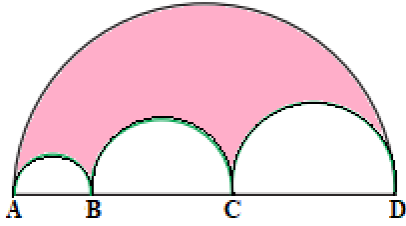
Javob: _____

7. Chizmada ABCD to'g'ri to'rtburchak berilgan. Ma'lumotlardan foydalanib, bo'yalgan soha yuzini toping.



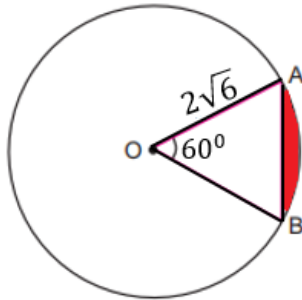
Javob: _____

8. Agar \overline{AD} , \overline{AB} , \overline{BC} va \overline{CD} yarim aylanalar, $12|AB| = 4|BC| = 3|CD|$ va bo'yalgan soha perimetri 16π bo'lsa, o'sha bo'yalgan soha yuzini toping.



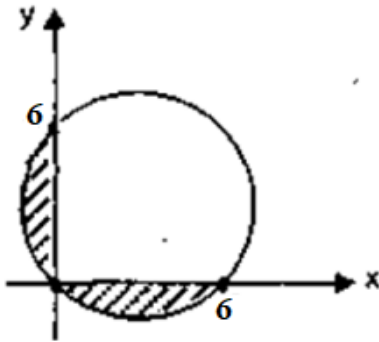
Javob: _____

9. Chizmadagi ma'lumotlardan foydalanib, bo'yalgan soha yuzini toping.



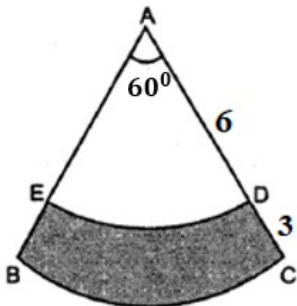
Javob: _____

10. Berilgan shaklga ko'ra shtrixlangan soha yuzasi qancha?



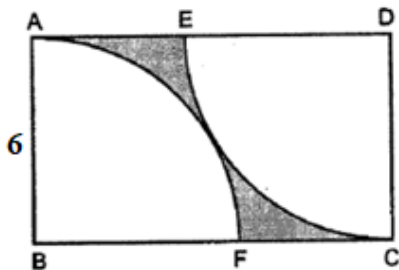
Javob: _____

11. Chizmada berilgan ma'lumotlar orqali bo'yalgan soha yuzini toping.



Javob: _____

12. ABCD to'g'ri to'rtburchak yuzidan markazlari B va D nuqtalarda bo'lgan chorak doiralar yuzlari xuddi chizmadagidek ayirib tashlandi. Agar AB kesma uzunligi 6 cm bo'lsa bo'yalgan soha yuzini hisoblang.



Javob: _____

Prizma va silindr	Q	Qisqa javobli	Javob: _____
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1. Uchburchakli to'g'ri prizmaning barcha qirralari bir xil uzunlikka ega va to'la sirti $8 + 16\sqrt{3}$ ga teng. Prizma asosining yuzini toping.

Javob: _____

2. To'g'ri to'rtburchakli muntazam prizma asosining yuzi 144 cm^2 , balandligi 14 cm. Prizma diagonalini (cm) toping.

Javob: _____

3. Uchburchakli muntazam prizma yon yog'i diagonalini bilan ikkinchi yon yog'i orasidagi burchak 30° . Asos qirrasi 2 cm. Prizma yon sirtini toping.

Javob: _____

4. Muntazam to'rtburchakli prizma asosining yuzi 36 cm^2 ga teng. Agar prizmaning diagonalini yon qirrasi bilan 30° li burchak tashkil etsa, prizmaning yon sirti nimaga teng?

Javob: _____

5. To'g'ri parallelipipedning diagonalini 8 cm, asosini katta tomoni 6 cm. Parallelipipedning diagonalini va katta yon yog'ini diagonalini orasidagi burchak 30° ga teng bo'lsa, uning asos yuzini toping.

Javob: _____

6. Oltiburchakli muntazam prizmaning eng katta diagonal kesimining yuzi 1 m^2 ga teng. Prizmaning yon sirtini toping.

Javob: _____

7. Tomoni 2 cm ga teng bo'lgan kvadratdan silindr o'ralgan bo'lsa, uning asosining yuzini toping.

Javob: _____

8. Silindrning balandligi 16 cm, asosining radiusi 10 cm. Silindrning o'qiga parallel kesim o'tkazilgan va u o'qdan 6 cm uzoqlikda yotadi. Shu kesimning yuzini toping.

Javob: _____

9. Silindr balandligi 8 ga, yon sirti yoyilmasining diagonali 10 ga teng. Silindr yon sirtining yuzini toping.

Javob: _____

10. Silindrning to'la sirti 80π , yon sirti esa 30π ga teng. Shu silindr hajmini toping.

11. Silindrning balandligi 35 ga, asosining radiusi 10 ga teng. U Javob: _____ oxirlari ikkala asos aylanalarida yotadi. Bu kesmadan silindr o'qigacha bo'lgan masofani toping.

Javob: _____

12. Silindrning yon sirti yuzi asoslari yuzlari yig'indisiga teng. Agar balandligi 4 bo'lsa, asosi radiusini toping.

Javob: _____

Piramida va konus	Q	Qisqa javobli	Javob: _____
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1. O'q kesimi uchidagi burchagi 120° bo'lgan konus yon sirtining yuzi o'q kesimi yuzidan necha marta katta bo'ladi?

Javob: _____

2. Konus yasovchisi asos radiusidan 3 marta katta. Konus to'la sirtining asos yuziga nisbatini toping.

Javob: _____

3. Konusning yon sirti $369\pi \text{ cm}^2$, to'la sirti $450\pi \text{ cm}^2$ bo'lsa, uning hajmini toping.

Javob: _____

4. Konus yasovchisi 4 cm ga teng va u asos tekisligi bilan 60° li burchak tashkil etadi. Konusning hajmini toping.

Javob: _____

5. Yasovchisi 26 ga, balandligi 10 ga teng bo'lgan konus asosining yuzini toping.

Javob: _____

6. Asos aylanasining uzunligi 8π ga, balandligi 9 ga teng bo'lgan konusning hajmini toping.

Javob: _____

7. Uchburchakli muntazam piramida asosining tomoni 12 ga teng. Agar asosidagi barcha ikki yoqli burchaklar 45° bo'lsa, piramida hajmini toping.

Javob: _____

8. To'rtburchakli muntazam piramida balandligi 3 ga, yon qirralari esa 5 ga teng bo'lsa, piramida hajmini toping.

Javob: _____

9. Muntazam piramida yon sirtining yuzi 48 cm^2 ga, apofemasi 8 cm ga teng. Piramida asosining perimetrini toping.

Javob: _____

10. Piramidaning asosi to'g'ri burchakli uchburchak bo'lib, uning gipotenuzasi uzunligi 10 dm ga teng. Piramidaning yon qirralari 13 dm ga teng bo'lsa, uning balandligini toping.

Javob: _____

11. Muntazam oltiburchakli piramidaning hajmi 324 ga, balandligi $6\sqrt{3}$ ga teng. Shu piramidaning yon qirralari va asos tekisligi orasidagi burchakni toping.

Javob: _____

12. Muntazam to'rtburchakli piramidaning hajmi 20 cm^3 ga, balandligi esa 1 cm ga teng. Piramidaning apofemasi uzunligini toping.

Javob: _____

Egri chizikli trapetsiya. Jism hajmini topish	M	To'la yechimli	Asoslangan yechim va javobni keltirish
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1. $y = \sqrt{9 - x^2}$, $x = 0$ chiziqlar bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

2. $y = \cos x$, $x = 0$, $x = \frac{\pi}{2}$, $y = 0$ chiziqlar bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

3. $y = \ln x$, $y = 1$, $y = 0$ va $x = 0$ chiziqlar bilan chegaralangan sohaning Oy o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

4. $y = \sqrt{x}$ egri chiziq va $y = x$, $x = 1$, $x = 0$ to'g'ri chiziqlar bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

5. $y = \sqrt{x}$ va $y = x^3$ egri chiziqlar bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

6. $y = x$ to'g'ri chiziq va $y^2 = 4x$ egri chiziq bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

7. $y = 2$ to'g'ri chiziq va $y = 9x^2$, $y = 4x^2$ egri chiziqlar bilan chegaralangan sohaning Oy o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

8. $y = \frac{1}{x}$ egri chiziq $y = 1$ va $y = 4$ to'g'ri chiziqlar bilan chegaralangan soha Oy o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

9. $y = 2x - x^2$ parabola va Ox o'qi bilan chegaralangan soha Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

Javob: _____

10. $y = \sqrt{-x^2 + 2x + 3}$ egri chiziq va Ox o'qi bilan chegaralangan sohaning Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmi necha birlik kub bo'ladi?

Javob: _____

11. $y^2 = 4x$ parabola va $x = 2$ to'g'ri chiziq bilan chegaralangan sohaning Ox o'qi atrofida 180° aylantirishdan hosil qilingan jism hajmi necha birlik kub bo'ladi?

Javob: _____

12. $y = \frac{1}{2}x^2$ va $y^2 = 2x$ egri chiziqlar bilan chegaralangan sohaning Oy o'qi atrofida aylantirish natijasida hosil bo'lgan jism hajmini toping?

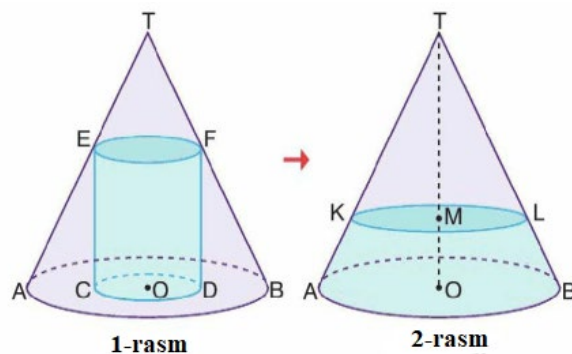
Javob: _____

Geometrik jismlar kombinatsiyasi	M	To'la yechimli	Asoslangan yechim va javobni keltirish
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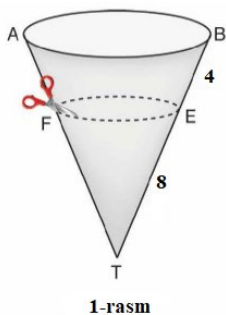
1. Balandligi 18 cm ga, asosining radiusi esa 9 cm ga teng bo'lgan konusga balandligi 10 cm ga teng bo'lgan silindr ichki chizilgan. Silindrning hajmini toping.

A) $150\pi \text{ cm}^3$ B) $160\pi \text{ cm}^3$ C) $202,5\pi \text{ cm}^3$ D) $90\pi \text{ cm}^3$

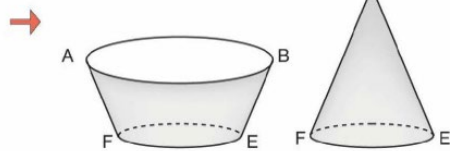
2. Konus asosining radiusi 3 cm ga, o'q kesimining uchidagi burchagi 60^0 ga teng. Shu konusga tashqi chizilgan muntazam uchburchakli piramidaning hajmini toping.
 A) 81 cm^3 B) 72 cm^3 C) 90 cm^3 D) 102 cm^3
3. Piramidaning yon sirti 36 cm^2 ga teng. Piramidaning asosidagi barcha ikki yoqli burchaklari teng bo'lib, ularning har biri 60^0 ga teng. Agar piramidaga ichki chizilgan sharning radiusi 4 cm ga teng bo'lsa, piramida hajmini toping.
 A) 63 cm^3 B) 54 cm^3 C) 72 cm^3 D) 64 cm^3
4. Uchburchakli muntazam piramidaga tashqi chizilgan sharning markazi uning balandligini 2 cm va 1 cm ga teng bo'lgan qismlarga ajratadi. Piramidaning hajmini toping.
 A) $4\sqrt{3} \text{ cm}^3$ B) $\frac{18\sqrt{3}}{4} \text{ cm}^3$ C) $\frac{9\sqrt{3}}{4} \text{ cm}^3$ D) $\frac{27\sqrt{3}}{4} \text{ cm}^3$
5. Kesik konus asoslarining yuzlari $4\pi \text{ cm}^2$ va $9\pi \text{ cm}^2$ ga teng. Agar bu konusga sharni ichki chizish mumkin bo'lsa, konusning yon sirtini toping.
 A) $36\pi \text{ cm}^2$ B) $24\pi \text{ cm}^2$ C) $30\pi \text{ cm}^2$ D) $25\pi \text{ cm}^2$
6. Asosining radiusi 5 ga teng bo'lgan silindrga konus ichki chizilgan. Konusning asosi silindrning asosi bilan, uchi esa silindr ustki asosining markazi bilan ustma – ust tushadi. Konusning yon sirti 65π ga teng. Silindrning hajmini toping.
 A) 270π B) 320π C) 300π D) 350π
7. Radiusi 9 dm bo'lgan sharga to'rtburchakli muntazam prizma ichki chizilgan. Agar prizmaning balandligi 14 dm bo'lsa, prizmaning hajmini toping.
 A) $918\sqrt{2} \text{ dm}^3$ B) 729 dm^3 C) 756 dm^3 D) 896 dm^3
8. Oltiburchakli muntazam prizmaning balandligi 8 dm, yon yog'ining diagonali 13 dm ga teng. Unga tashqi chizilgan sharning hajmini toping.
 A) $\frac{5324\pi}{3} \text{ dm}^3$ B) $\frac{4832\pi}{3} \text{ dm}^3$ C) $\frac{5136\pi}{3} \text{ dm}^3$ D) $\frac{4528\pi}{3} \text{ dm}^3$
9. Sharga to'rtburchakli muntazam piramida ichki chizilgan, uning balandligi sharning markazi bilan 5 cm va 4 cm dan iborat ikki bo'lakka bo'lingan. Piramidaning hajmini toping.
 A) 64 cm^3 B) 72 cm^3 C) 54 cm^3 D) 60 cm^3
10. Asosining markazi O nuqtada bo'lgan konusga ichi suv bilan to'ldirilgan silindr 1-rasmdagidek joylashtirilgan (bunda O nuqta silindr asosining ham markazi). Keyinchalik silindr ichidagi suv konus ichiga bo'shatilib, konus ichidan silindr olib tashlandi va 2-rasmdagidek ko'rinishga keltirildi. Berilganlardan foydalanib, 2-rasmdagi $\frac{TM}{TO}$ nisbatni toping (Bunda $OD = BD$).



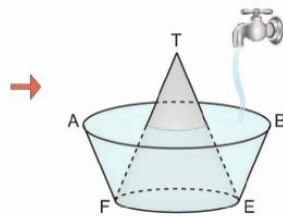
11. 1-rasmda ko'rsatilganidek, konus shaklidagi idish AB asosiga parallel ravishda EF bo'ylab kesildi va 2-rasmdagi qismlarga ajratildi. 2-rasmda kichik konus shaklidagi idish 3-rasmdagidek kesik konus shaklidagi idish ichiga joylandi va kesik konus shaklidagi idish hamda kichik konus shaklidagi idish orasidagi bo'shliq suv bilan to'ldirildi. Agar $BE = 4$ birlik, $TE = 8$ birlik bo'lsa, suv hajmining 2-rasmdagi kichik konus hajmiga nisbatini toping.



1-rasm



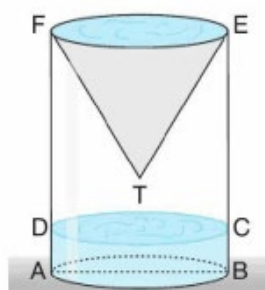
2-rasm



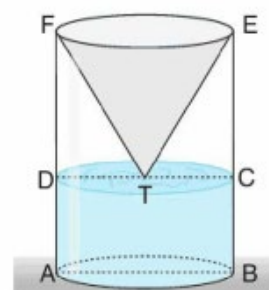
3-rasm

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

12. Silindr shaklidagi idish ustidagi konus shaklidagi idish suv bilan to'ldirilgan va uning hajmi silindrdagi suv hajmiga teng (1-rasmga qarang). Konus shaklidagi idishning T uchidan teshik ochilgan va suv silindrga bo'shatilganda suvning sathi 2-rasmda ko'rsatilganidek T nuqtaga yetdi. Agar silindr shaklidagi idishning balandligi 15 birlikga teng bo'lsa, konus shaklidagi idishning balandligi necha birlik?



1-rasm



2-rasm

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