MAKTABGACHA VA MAKTAB TA'LIMI VAZIRLIGI

PEDAGOGIK MAHORAT VA XALQARO BAHOLASH ILMIY-AMALIY MARKAZI

Respublika Ta'lim Markazi

O'ZBEKISTON RESPUBLIKASI
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ILMIY-AMALIY MARKAZI

2023
2024

O'QUV YILIDA
UMUMTA'LIM
MAKTABLARINING 11-SINF
O'QUVCHILARI UCHUN

MATEMATIKA

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

2023-2024-O‘QUV YILIDA UMUMTA’LIM 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 Pedagogik mahorat va xalqaro baholash ilmiy-amaliy markazi.

D.E. Shnol- ta'lim bo‘yicha xalqaro ekspert.

11-sinfini tugatgan o‘quvchilar matematika fanidan ta’lim dasturi bo‘yicha standartlar asosida belgilangan kompetensiyalarga ega bo‘ladilar.

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

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

O‘quvchilarga taklif etilgan baza savollaridan tashkil topgan 2 ta bilet taqdim etiladi. Biletda o‘quvchiga 10 tadan (6 ta algebra, 4 ta geometriya) savol beriladi. Savollarning 3 tasi (2 ta algebra, 1 ta geometriya) bilishga, 5 tasi (3 ta algebra, 2 ta geometriya) qo‘llashga, 2 tasi (1 ta algebra, 1 ta geometriya) mulohazaga oid bo‘ladi. Bilet savollariga javob berishi uchun umumiy 180 daqiqa vaqt beriladi. Berilgan topshiriqlardan yakuniy davlat attestatsiyasi o‘tkazilishi belgilangan kundan bir kun oldin, ishchi guruh tomonidan qur’a tashlash yo‘li bilan 2 ta variant tuzilib, e‘lon qilinadi.

O‘quvchilarning yozma ishlari algebradan maksimal 60 ball va geometriyadan maksimal 40 ball bilan baholanadi.

Algebradan:

0 – 17 ball – “qoniqarsiz”;
18– 39 ball – “qoniqarli”;
40–51 ball – “yaxshi”;
52–60 ball – “a‘lo”

Geometriyadan:

0 – 11 ball – “qoniqarsiz”;
12–26 ball – “qoniqarli”;
27 –34 ball – “yaxshi”;
35–40 ball – “a‘lo”

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	2	1	1		1		1
Matematik analiz	3		2	1	1	1	1
Statistika va ehtimollik	1	1			1		

Stereometriya	**4**	**1**	**2**	**1**	**1**	**1**	**2**
	10	**3**	**5**	**2**	**4**	**2**	**4**

TOPSHIRIQ BO‘YICHA BAHOLASH MEZONI

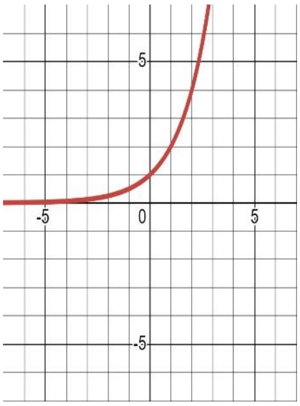
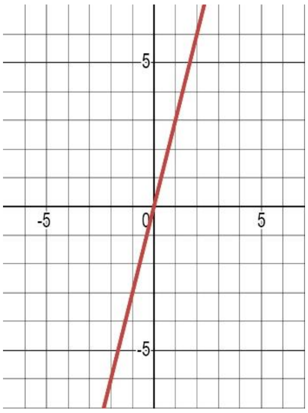
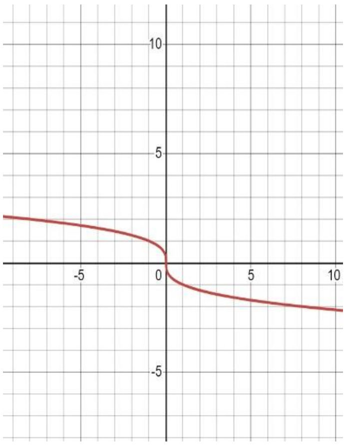
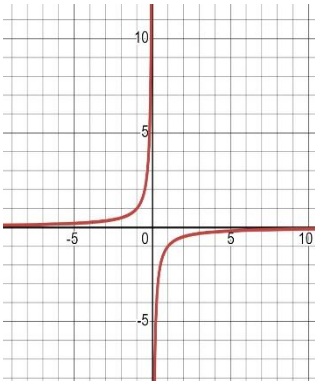
№	Bo‘lim nomi		Topshiriq turi	Topshiriq shakli	Baholash mezoni
Algebra va funksiyalar					
1	Funksiyalarning grafiklarni o‘qish va farqlash	B	Jadval	Moslikni aniqlash 1 2 3 4	Agar o‘quvchi 4 ta topshiriqdan: **1-hol.** Faqat bittasiga to‘g‘ri javob bergan bo‘lsa, **2 ball; 2-hol.** Berilgan topshiriqlardan 2 tasiga to‘g‘ri javob bergan bo‘lsa, **4 ball;** **3-hol.** Berilgan topshiriqlardan 3 tasiga javob bergan bo‘lsa, **6 ball;** **4-hol.** Berilgan topshiriqlarning barchasiga to‘g‘ri javob bersa, **8ball** beriladi. Xato javob uchun **0 ball** beriladi.
2	Sodda tigonometrik tenglamalarni yechish. Logarifmik va ko‘rsatkichli tenglamalarni yechish.Trigonometrik tengsizliklarni, logarifmik va ko‘rsatkichli tengsizliklarni yechish.	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					
3	Egri chiziqli trapetsiya yuzini topish.	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	Hosila, boshlang‘ich funksiyani topish integrallash usullari qo‘llash, aniq integralni hisoblash.	Q	Jadval	Moslikni aniqlash <table><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>	Agar o‘quvchi 4 ta topshiriqdan: **1-hol.** Faqat bittasiga to‘g‘ri javob bergan bo‘lsa, **2 ball;** **2-hol.** Berilgan topshiriqlardan 2 tasiga to‘g‘ri javob bergan bo‘lsa, **4 ball;** **3-hol.** Berilgan topshiriqlardan 3 tasiga javob bergan bo‘lsa, **12 ball; 7-hol.** Berilgan topshiriqlarning barchasiga to‘g‘ri javob bersa, **10 ball** beriladi. Xato javob uchun **0 ball** beriladi.
5	Hosila yordamida amaliy masalalarni yechish.	M	To‘la yechimli	Asoslangan yechim va javobni keltirish	O‘quvchi topshiriqni bajarishda masalaning matematik modelini to‘g‘ri tuza olsa, ekstriumlarini topa olsa, masalaning javobini to‘la shakllantira olsa **14 ball** bilan baholanadi.
Matematik statistika va ehtimollar nazariyasi					
6	Hodisalar ustida amallarni bajarish.	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 **8 ball** beriladi. Xato javob uchun **0 ball** beriladi.
Stereometriya					

7	Shar va sfera, ularning qismlarining yuzi, hajmi va elementlarini topish	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 **8 ball** beriladi. Xato javob uchun **0 ball** beriladi.
8	Piramida va prizma yuzi, hajmi va elementlarini topish	Q	Qisqa javobli	Javob: ________________	Javobi yoziladigan test bo‘lib, to‘g‘ri sonli javob uchun **8 ball** bilan baholanadi. O‘lchov birligi to‘g‘ri qo‘yilsa qo‘yilsa **2 ball**. Jami **10 ball**. Xato javob uchun **0** ball beriladi.
9	Konus va silindr yuzi, hajmi va elementlarini topish	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 **10 ball** bilan baholanadi.
10	Geometrik jismlar kombinatsiyasiga oid amaliy masalalarni yechish	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 **12 ball** bilan baholanadi.

1-savol

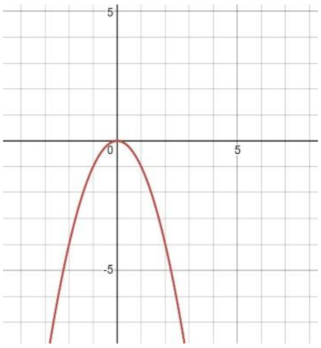
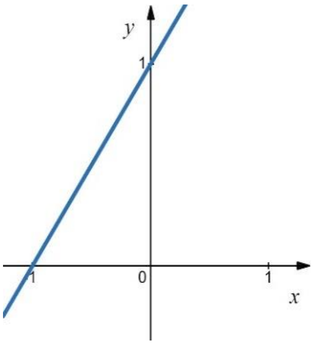
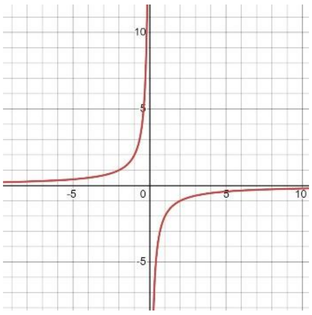
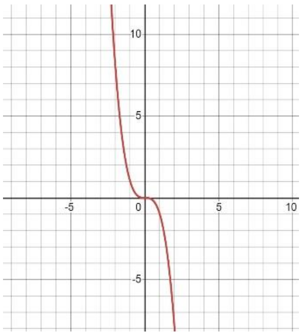
1. Berilgan grafiklarni funksiyalarga moslashtiring:

1	**2**	**3**	**4**
			

A	**B**	**C**	**D**	**E**
$\boldsymbol{y = \frac{2}{x}}$	$\boldsymbol{y = \sqrt[3]{x}}$	$\boldsymbol{y = 2^x}$	$\boldsymbol{y = 3x}$	$\boldsymbol{y = -\frac{1}{x}}$

1	2	3	4

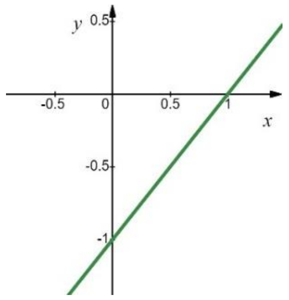
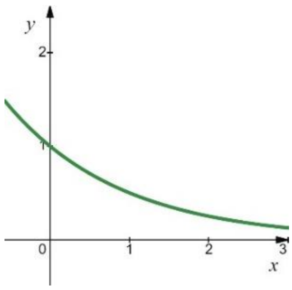
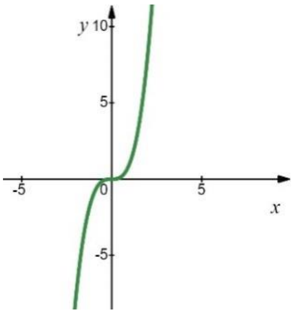
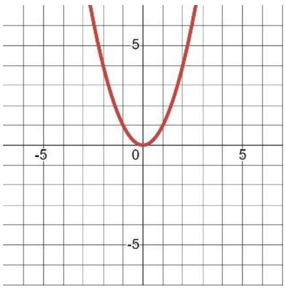
2. Berilgan grafiklarni funksiyalarga moslashtiring:

1	**2**	**3**	**4**
			

A	B	C	D	E
$y=-\sqrt{x}$	$y=-\dfrac{2}{x}$	$y=x+1$	$y=-x^3$	$y=-x^2$

1	2	3	4

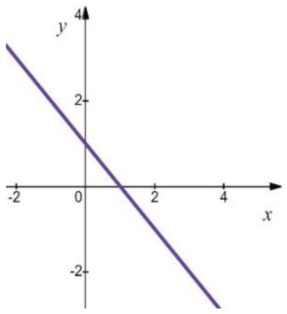
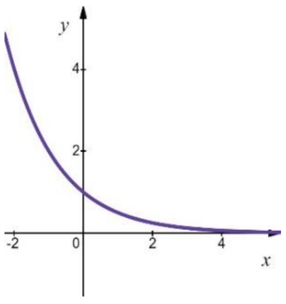
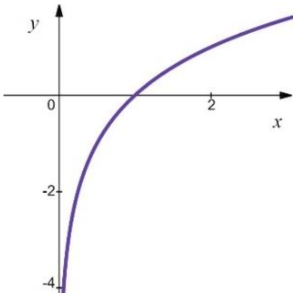
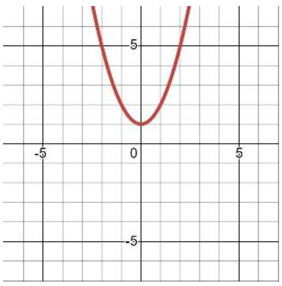
3. Berilgan grafiklarni funksiyalarga moslashtiring:

1	2	3	4
			

A	B	C	D	E
$y=\dfrac{3}{x}$	$y=x-1$	$y=x^2$	$y=\left(\dfrac{1}{2}\right)^x$	$y=x^3$

1	2	3	4

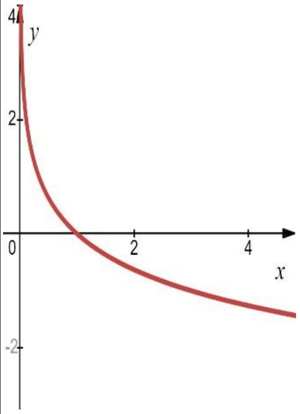
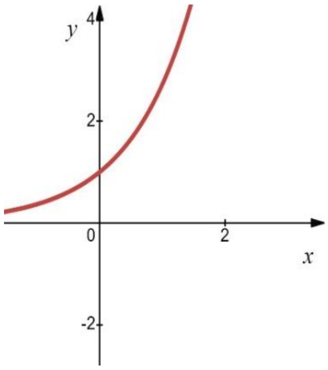
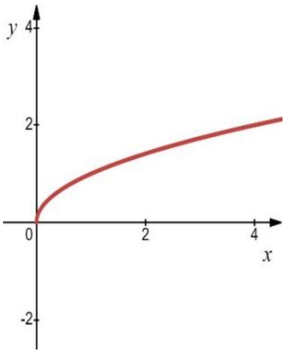
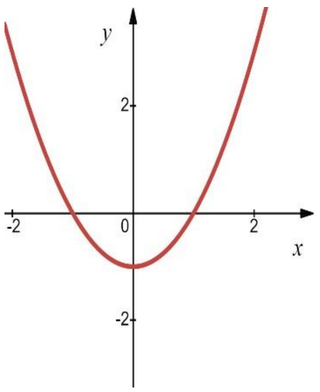
4. Berilgan grafiklarni funksiyalarga moslashtiring:

1	2	3	4
			

A	**B**	**C**	**D**	**E**
$y = \log_2 x$	$y = x^2 + 1$	$y = 0,5^x$	$y = 1 - x$	$y = \dfrac{5}{x}$

1	2	3	4

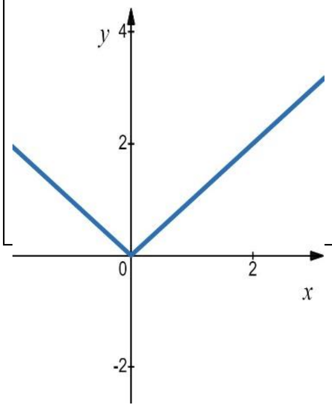
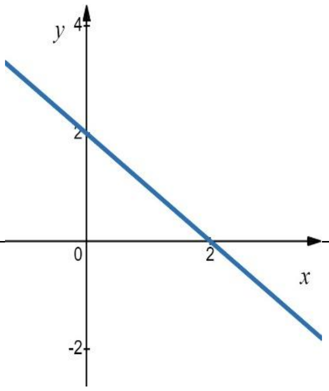
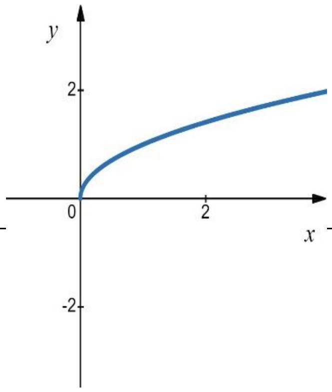
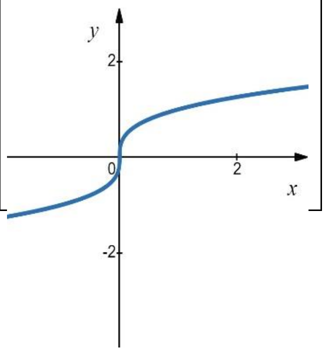
5. Berilgan grafiklarni funksiyalarga moslashtiring:

1	**2**	**3**	**4**
			

A	**B**	**C**	**D**	**E**
$y = \dfrac{3}{x}$	$y = \sqrt{x}$	$y = \log_{\frac{1}{2}} x$	$y = x^2 - 1$	$y = e^x$

1	2	3	4

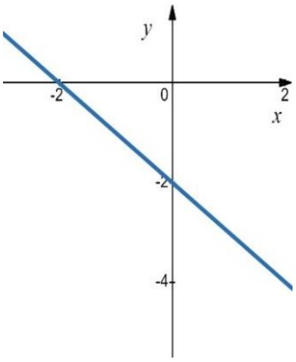
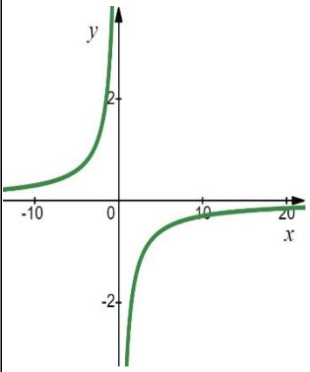
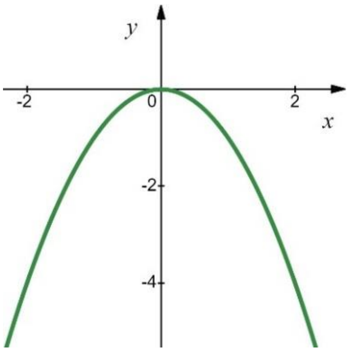
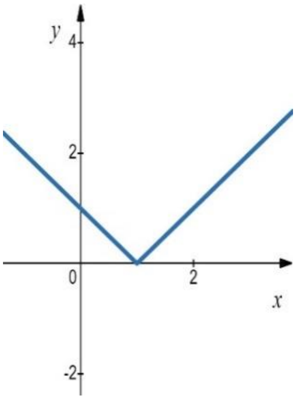
6. Berilgan grafiklarni funksiyalarga moslashtiring:

1	**2**	**3**	**4**
			

A	B	C	D	E
$y = \sqrt{x}$	$y = \sqrt[3]{x}$	$y = 2 - x$	$y = \lvert x \rvert$	$y = x^2 - 2x$

1	2	3	4

7. Berilgan grafiklarni funksiyalarga moslashtiring:

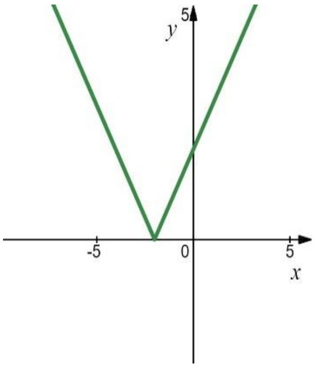
1	2	3	4
			

A	B	C	D	E
$y = -x^2$	$y = 2^x$	$y = -x - 2$	$y = -\frac{3}{x}$	$y = \lvert x - 1 \rvert$

1	2	3	4

8. Berilgan grafiklarni funksiyalarga moslashtiring:

1



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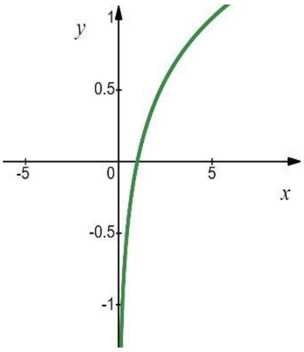

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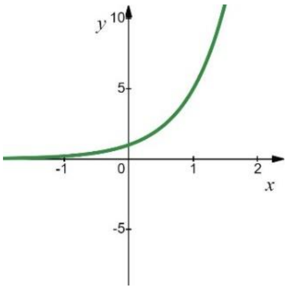

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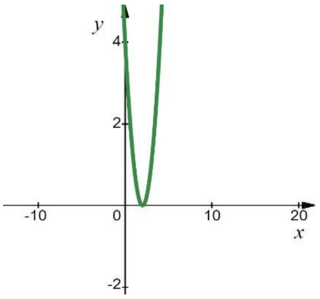
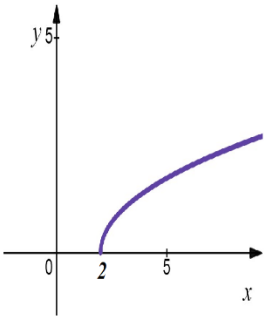


A	**B**	**C**	**D**	**E**
$\boldsymbol{y = 5^x}$	$\boldsymbol{y = (x-2)^2}$	$\boldsymbol{y = \log_5 x}$	$\boldsymbol{y = \sqrt[3]{x}}$	$\boldsymbol{y = \lvert x+2 \rvert}$

1	2	3	4

9. Berilgan grafiklarni funksiyalarga moslashtiring:

1



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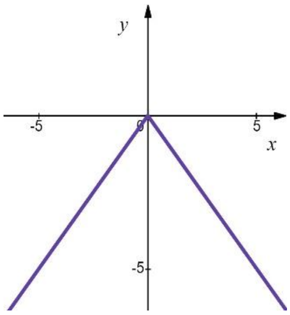

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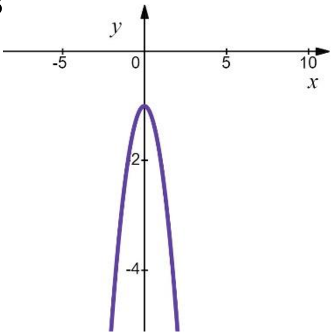

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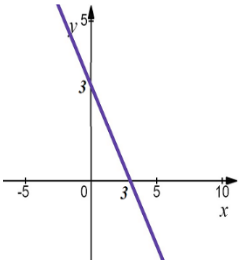
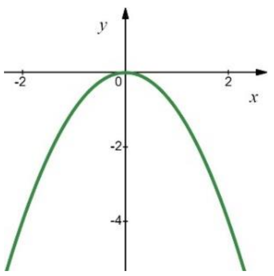
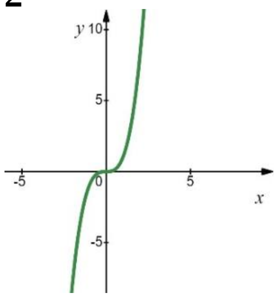
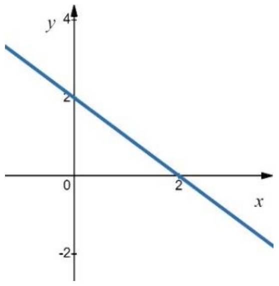
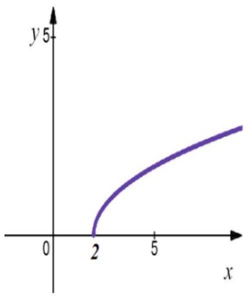


A	**B**	**C**	**D**	**E**
$\boldsymbol{y = 6x}$	$\boldsymbol{y = -1 - x^2}$	$\boldsymbol{y = \sqrt{x-2}}$	$\boldsymbol{y = -x + 3}$	$\boldsymbol{y = -\lvert x \rvert}$

1	2	3	4

10. Berilgan grafiklarni funksiyalarga moslashtiring:

1	2	3	4
			

A	B	C	D	E
$\boldsymbol{y = \sqrt{x-2}}$	$\boldsymbol{y = 5^x}$	$\boldsymbol{y = x^3}$	$\boldsymbol{y = 2 - x}$	$\boldsymbol{y = -x^2}$

1	2	3	4

2-savol

1.Tenglamani yeching: $5^{x^2-6} - 125 = 0$

2. Ushbu $\log_2(x-4) = 2$ logarifmik tenglamaning ildizi x_0 bo‘lsa, $\frac{x_0+2}{2}$ ning qiymatini toping.

3. Tenglamani yeching: $2sin2x + 1 = 1$

4. Tenglamani yeching: $\log_3 x + 1 = \log_2 8$

5. Tenglamani yeching: $4^x = 8$

6. Tengsizlikni yeching: $9^{2x-1} - 81 < 0$

7. Ushbu $\log_3 x > 1$ logarifmik tengsizlikni yeching.

8. Trigonometrik tengsizlikni yeching: $-Cosx \leq -0{,}5$

9. Tengsizlikni yeching: $3 \cdot 12^x \leq 36$

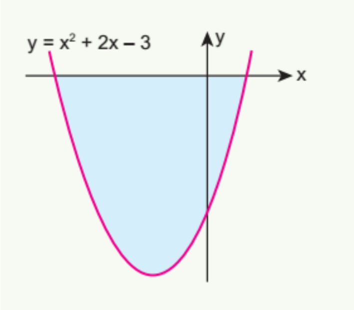
10.Tengsizlikni yeching: $1 + 2lgx > 0$

3-savol

1. Ushbu $y = x^3$, $y = 0$, $x = 1$ va $x = 2$ chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

A) 8 B) 4 C) $1\frac{1}{2}$ D) $3\frac{3}{4}$

2. Quyidagi rasmda, $y = x^2 + 2x - 3$ parabola grafigi tasvirlangan. Grafikdan foydalanib, *Ox* o‘qi va parabola bilan chegaralangan sohani yuzini (kv.birlik) toping.



A) 12 B) 11 C) $\frac{32}{3}$ D) $\frac{35}{3}$

3. Ushbu $y = 2x^2$, $y = 0$ va $x = 3$ chiziqlar bilan chegaralangan figuraning yuzi necha kvadrat birlik bo‘ladi?

A) 18 B) 27 C) 54 D) 36

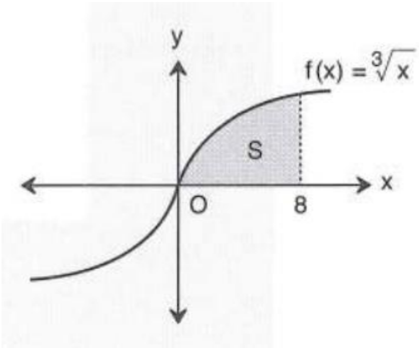
4. Quyidagi chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

$$y = \frac{1}{\sqrt{x}}, \quad y = 0, \quad x = 1, \quad x = 4$$

A) 5 B) 2 C) 3 D) 1

5. Quyidagi rasmda, $y = \sqrt[3]{x}$ funksiya grafigi tasvirlangan. Grafikdan foydalanib, $y = 0,\ y = \sqrt[3]{x},\ \ x = 0$ va $x = 8$ chiziqlar chegaralangan sohani yuzini (kv.birlik)

toping.



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

6. Ushbu $y = x^3 - 1$, $y = 0$, $x = 1$va $x = 3$ chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

A) 22 B) 18 C) 19,5 D) 22,5

7. Ushbu $y = cosx$, $y = 0$, $x = 0$ va $x = \frac{\pi}{6}$ chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

A) $2\sqrt{3}$ B) 1,5 C) $\sqrt{3}$ D) 0,5

8. Ushbu $y = \sqrt[3]{x}$, $y = 0$, $x = 1$ va $x = 8$ chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

A) $11\frac{3}{4}$ B) $12\frac{3}{5}$ C) 11 D) 9

9. Ushbu $y = \frac{1}{x+7}$, $y = 0$, $x = 0$ va $x = 2$ chiziqlar bilan chegaralangan egri chiziqli trapetsiyaning yuzini (kv.birlik) toping.

A) $\ln\left(\frac{8}{7}\right)$ B) $\ln\left(\frac{9}{7}\right)$ C) $\ln\left(\frac{10}{7}\right)$ D) $\ln\left(\frac{6}{7}\right)$

10. Berilgan $y = 4x - x^2$ parabola bilan *Ox* o‘qi orasidagi sohani yuzini (kv.birlik) toping.

A) $\frac{8}{3}$ B) $\frac{16}{3}$ C) $\frac{38}{3}$ D) $\frac{32}{3}$

4-savol

1.Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $8x^7$ 2. $\sqrt[3]{x^2}$	A. $\frac{3}{5}\ x\sqrt[3]{x^2} + C$
	B. $\ln\lvert 2x\rvert + C$

3. $\frac{2}{x},\ x \neq 0$ 4. $3sin3x$	C. $-cos3x + C$
	D. $-\frac{1}{3}cos3x + C$
	E. $x^8 + C$
	F. $\ln x^2 + C$

1	2	3	4

2. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $\frac{1}{xln5},\ x > 0$	A. $\frac{1}{7}tg7x + C$
	B. $\log_5\lvert x\rvert + C$
2. $\frac{1}{x^{-4}},\ x \neq 0$	C. $-tg7x + C$
	D. $-\frac{1}{3x^{-3}} + C$
3. $\frac{1}{cos^2 7x}\ , x \neq \frac{\pi}{14} + \frac{\pi n}{7}, (n \in Z)$	E. $\frac{8^x}{3 \cdot ln2} + C$
4. 2^{3x}	F. $\frac{1}{3} \cdot \frac{2^{3x}}{ln2} + C$

1	2	3	4

3. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $x + 2$	A. $\ln\lvert x - 1\rvert + C$
	B. $-\frac{1}{3}e^{1-3x} + C$
2. $\frac{1}{x-1},\ x \neq 1$	C. $-3e^{1-3x} + C$
	D. $-\frac{1}{4}ctg4x + C$
3. e^{1-3x}	E. $-ctg4x + C$
4. $\frac{1}{sin^2 4x},\ x \neq \frac{\pi n}{4}, (n \in Z)$	F. $\frac{x^2}{2} + 2x + C$

1	2	3	4

4. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $6x^2 - 2x$	A. $\frac{3}{2}\sqrt{x} + C$
2. $\frac{3}{4\sqrt{x}},\ x \neq 0$	B. $-2e^{-x} + C$
	C. $-\frac{1}{2}e^{-x} + C$
3. $\frac{2}{e^x}$	D.$2x^3 - x^2 + C$
	E. $-tg3x + C$
4. $-\frac{1}{cos^2 3x},\ \ x \neq \frac{\pi}{6} + \frac{\pi n}{3}, (n \in Z)$	F. $-\frac{1}{3}tg3x + C$

1	2	3	4

5. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $-x + \frac{x^2}{2}$	A. $\ln\|x + 1\| + C$
	B. $\frac{3^{2+3x}}{5ln3} + C$
2. $\frac{1}{1+x},\ \ x \neq -1$	C. $-\frac{x^2}{2} + \frac{x^3}{6} + C$
3. 3^{2+5x}	D.$-\frac{1}{3}ctg\frac{x}{3}\ + C$
4. $\frac{1}{sin^2(\frac{x}{3})},\ x \neq 3\pi n, (n \in Z)$	E. $-3ctg\frac{x}{3} + C$
	F. $-x + \frac{x^2}{3} + C$

1	2	3	4

6. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $x^{-\frac{1}{3}} + 2$	A. $2\cos 3x + C$
	B. $\frac{3}{2}x^{\frac{2}{3}} + C$
2. $(x + 3)^{-1},\ \ x \neq -3$	C. $-2cos3x + C$

3. 7^{2x} 4. $-6sin3x,$	D.$-(x+3)^{-2}+C$ E. $\ln\|x+3\|+C$ F. $\frac{1}{2}\frac{\cdot 7^{2x}}{ln7}+C$

1	2	3	4

7. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. x^3	A. $e^{x+2}+C$
2. $\frac{3}{x+6}$, $(x\neq-6)$	B.$-\frac{1}{3}\cos 9x+C$
	C. $\frac{x^4}{4}+C$
3. e^{x+2}	D.$3\ln\|x+6\|+C$
	E. $-3cos9x+C$
4. $3sin9x$	F. $3x^2+C$

8. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $\sqrt[5]{x^2}$	A. $\ln\|x-1\|+C$
2.$-\frac{6}{x^2}$, $x\neq 0$	B.$\frac{5}{7}x\sqrt[5]{x^2}+C$
	C. $\frac{6}{x}+C$
3. $\frac{1}{e^{-4x}}$	D.$\frac{1}{4}e^{4x}+C$
	E. $2ctg3x+C$
4. $\frac{-6}{sin^2 3x}$, $x\neq\frac{\pi n}{3}$, $(n\in Z)$	F. $\frac{x^2}{2}+2x+C$

1	2	3	4

9.Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $\frac{1}{\sqrt[3]{x}}$ $x \neq 0$	A. $5e^{5x} + C$
	B. $\frac{3}{2}\sqrt[3]{x^2} + C$
2. $\frac{1}{x+9}$, $x \neq -9$	C. $\ln\lvert x+9\rvert + C$
	D. $-\frac{1}{6}cos6x + C$
3. e^{5x}	E. $\frac{1}{5}e^{5x} + C$
4. $sin6x$,	F. $\frac{x^2}{2} + 2x + C$

1	2	3	4

10. Moslikni toping:

Funksiyalar	Boshlang‘ich funksiyalar
1. $4(x+2)^3$	A. $-96sin8x + C$
2. $\frac{1}{3x}$, $x \neq 0$	B. $-\frac{6^{-x}}{ln6} + C$
	C. $12(x+2)^2 + C$
3. 6^{-x}	D. $2sin8x + C$
4. $16cos8x$,	E. $\frac{1}{3}\ln\lvert x\rvert + C$
	F. $(x+2)^4 + C$

1	2	3	4

5-savol

1. Firma ko‘ylak tikish uchun buyurtma oldi. Bir oyda x ta ko‘ylak tiksa, $p(x) = -x^2 + 100x$ ming so‘m daromad qiladi. Firma eng katta daromad olish uchun qancha ko‘ylak tikishi kerak?

2.Ushbu $S(t) = t^3 - 6t^2 + 5t$ qonun bo‘yicha harakatlanayotgan motosikl harakat boshlangandan necha sekunddan keyin to‘xtaydi?

3.To‘g‘ri va tekis yo‘lda $x(t) = -t^3 + 3t^2 + 9t$ qonun bo‘yicha harakatlanayotgan Malibu mashinasi harakat boshlangandan necha sekunddan keyin to‘xtaydi?

4. Tezyurar motorli qayiq $S(t) = 6t^2 - 2t^3 + 5$ qununiyat bo‘yicha harakatlanayapti. Uning tezlanishi 0 ga teng bo‘lgandagi oniy tezligi nimaga teng.

5. O‘t o‘chiruvchi nasosidan otilib chiqayotgan suv $y = -0{,}2x^2 + 3x$ parabolani “chizadi”. O‘zgaruvchi x ning qanday qiymatida bu parabolaning otilib chiqayotgan suvning eng katta balandligi hosil bo‘ladi.

6. 5 m balandlikda kamondan otilgan 50 $\frac{m}{s}$ tezlik bilan yuqoriga vertikal ravishda nayza otildi.Nayzaning t sekundan keyin ko‘tarilgan balandligi metrlarda $h = h(t) = 5 + 50t - \frac{gt^2}{2}$ formula bilan hisoblanadi, bunda $g \approx 10\frac{m}{s^2}$. Nayza necha sekundan keyin, eng katta balandligiga erishadi va u qanday balandlik bo‘ladi?

7. Ushbu $S(t) = t\sqrt{t}$ qununiyat bilan harakatlanayotgan konkichining $t = 2$ sekunddagi tezlanishini hisoblang (S metrlarda).

8. 2 metr balandlikdan gorizontga ma’lum burchak ostida mushak (xabar beruvchi raketa) otildi.Vaqt o‘tishi bilan uning balandligi $h(t) = -t^3 + 18t^2 + 2$ formulaga ko‘ra o‘zgarib boradi. Qancha vaqtdan so‘ng raketa uchishining eng baland nuqtasiga ko‘tariladi?

9.Havo shari $t \in [0; 10]$ minut oralig‘ida $V(t) = 5t^3 + 3t^2 + 2t + 4 \quad (m)^3$ havo purkamoqda, $t = 3$ minutdan keyin havo purkash tezligini toping.

10. Ushbu $S(t) = 4t^2 - \frac{t^3}{3}$ qonuniyat bilan harakatlanayotgan salyutning eng katta tezligini aniqlang.

6-savol

1.Kub tashlanganda toq son chiqish ehtimolligini toping.

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

2. Tanga 3 marta tashlanganda, 3 marta gerb tushish ehtimolligini.

A) $\frac{1}{8}$ B) $\frac{3}{8}$ C) $\frac{7}{8}$ D) $\frac{5}{8}$

3.Beshta bir xil qog‘ozchalarning har biriga quyidagi harflardan biri takrorlamasdan yozilgan: O, B, M, K, R. Qog‘ozchalar qutiga solingan va yaxshlab aralashtirilgan. Qutiga qaramasdan bittalab olingan va olingan tartibda “BOR” so‘zi hosil bo‘lish ehtimolligini toping.

A) $\frac{1}{60}$ B) $\frac{1}{30}$ C) $\frac{1}{40}$ D) $\frac{1}{120}$

4. Savatda 30 ta olma va 40 ta nok bor. Savatdan tavakkaliga bir dona meva olindi. Uning nok bo‘lish ehtimolligini toping.

A) $\frac{1}{70}$ B) $\frac{5}{7}$ C) $\frac{3}{7}$ D) $\frac{4}{7}$

5. “VALI” ismidagi harflar oldin qirqilgan, so‘ng ular tavakkaliga bir qatorga tizilgan. Shu so‘zning qaytadan hosil bo‘lish ehtimolligini toping.

A) $\frac{1}{60}$ B) $\frac{1}{18}$ C) $\frac{1}{24}$ D) $\frac{1}{8}$

6. Idishda 21 dan 100 gacha (100 ham kiradi) natural sonlar yozilgan bir xil qog‘ozchalar bor. Tavakkaliga bitta qog‘ozcha olindi. Undagi sonning 11 ga bo‘linish ehtimolligini toping.

A) $\frac{1}{10}$ B) $\frac{3}{10}$ C) $\frac{1}{8}$ D) $\frac{5}{80}$

7. Bog‘da 25 ta qizil atirgul va 15 ta oq atirgul gullar bor. Kapalakning qizil atirgullarga qo‘nish ehtimolligini toping.

A) $\frac{1}{3}$ B) $\frac{5}{9}$ C) $\frac{8}{9}$ D) $\frac{3}{5}$

8. Mahtumquli ko‘chasidagi ko‘p qavatli uylar sotilmoqda, hamma uylar ikki xonali sonlar bilan nomerlangan. Uy sotib oluvchi mijoz, bitta uy sotib olmoqchi bo‘lgan uyning nomerida ikki raqami bo‘lishi ehtimolligini toping.

A) 0,2 B) 0,8 C) $\frac{19}{90}$ D) $\frac{2}{9}$

9. Siroj telefon raqamlarini terayotib oxirgi bitta raqamini unutib qo‘ydi va ularning turlicha va toq ekanligini eslab qolgan holda, tasodifiy ravishda bitta raqamni terdi.Terilgan telefon raqamlari to‘g‘ri bo‘lish ehtimolligini toping.

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

10. Sinfdagi 28 nafar o‘quvchilarning 16 nafari o‘g‘il bolalar, bir kishi bemor bo‘lganligi sababli darsga qatnashamayapti. Bemor o‘quvchining qiz bola bo‘lish ehtimolligini toping.

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

7-savol

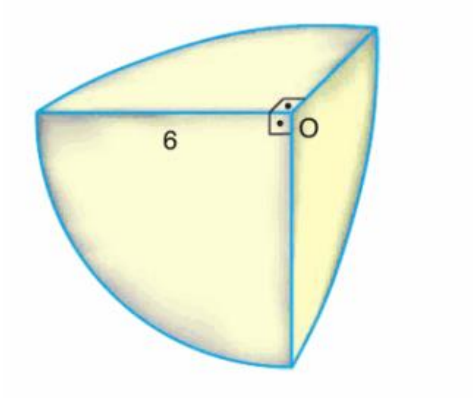
1. Yarim shar bilan qoplangan issiqxonaning radiusi 8 m ga teng. Shu issiqxona sirtini qoplash uchun ketadigan quyosh nurini o‘tkazuvchi materiya yuzini (m^2) hisoblang.

A) 32π B) $124\,\pi$ C) $128\,\pi$ D) $64\,\pi$

2. Temirdan yasalgan shar shaklidagi, sharni bo‘yash uchun 100 g buyoq ishlatildi. Agar sharning diametri to‘rt marta orttirilsa, uni buyash uchun necha kg buyoq kerak bo‘ladi?

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

3. Rasmda markazi O nuqtada va radiusi 6 cm bo‘lgan shar shaklidagi kumush metalning $\frac{1}{8}$ qismi berilgan. Shu kumush metal bo‘lagining sirtini toping.

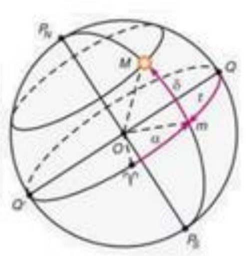


A) $63\,\pi$ B) $45\,\pi$ C) $24\,\pi$ D) $36\,\pi$

4. Quyidagi rasmda $AB = 40\,cm$ bo‘lgan yarim shar shaklidagi usti ochiq idish tasvirlangan. Agar $10\pi\ \ cm^2$ sirtni bo‘yash uchun 2 gramm bo‘yoq ketsa, idishni ustki va ichki qismini bo‘yash uchun qancha gramm bo‘yoq ketadi.

A)320 B) 480 C) 240 D) 360

5. Globusda meridian chiziq o‘tgan gorizontal tekislikning yuzi yuzi 225π kvadrat birlik. Globusdan yuzi 144π kvadrat birlik bo‘lgan doira kesib olindi. Kesim globus markazidan qanday (birlik) masofada joylashgan?

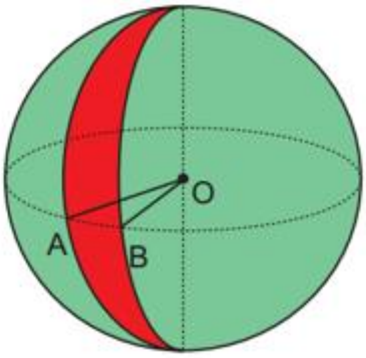


A) 7 B) 8 C) 9 D) 10

6. Radiuslari $2; 3$ va 4 ga teng bo‘lgan metall sharlar eritilib, bitta shar quyildi. Shu sharning hajmini toping.

A) 99π B) 132π C) 146π D) 126π

7.Rasmda O markazli sharsimon tarvuzning radiusi 12 cm. Agar tarvuzning o‘rtasidan $\angle AOB = 30^0$ bo‘lak kesib olinsa, kesib olingan bo‘lakning(tarvuz tilimining) sirti necha cm^2 bo‘ladi?



A) 196π B) 192π C) 240π D) 169π

8. Rasmdagi mayatnikda bitta katta shar va ikkita kichik sharchalar bor. Kichik sharlarning radiusi 2 cm, katta va kichik sharlar sirtlari orasidagi masofa 5 cm ga teng. Agar kichik sharlar markazlari orasidagi masofa 26 cm bo‘lsa, katta sharchaning hajmini cm^3 toping.

A) 288π B) 280π C) $248\ \pi$ D) $144\ \pi$

9.Shar shaklidagi katta nefritning radiusi 45 mm. Kichik nefritning hajmi $36\pi\ cm^3$ ga teng bo‘lsa, katta nefritning diametri kichik nefrit diametridan necha marta katta bo‘ladi?

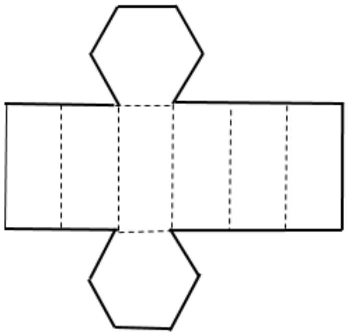
A) 0,5 B) 2,5 C) 2 D) 1,5

10. Hajmi 4500π bo‘lgan shar shaklidagi tarvuz teng ikkiga bo‘lindi. Hosil bo‘lgan bo‘laklardan birining sirtini toping.

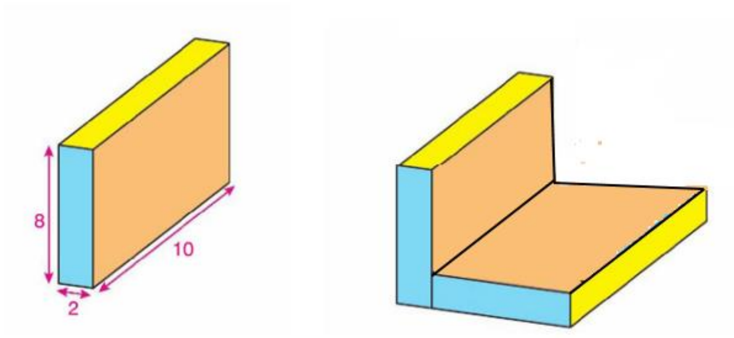
A) 675π B) 625π C) 643π D) 640π

8- savol

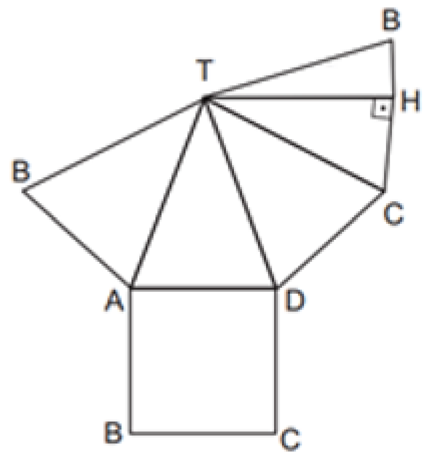
1. Tunikadan yasalgan muntazam oltiburchakli prizmaning bitta yon yoqi perimetri 12 cm va bitta asosining perimetri 12 cm. Prizma rasmdagidek yoyilganda, yoyilmaning perimetrini toping.



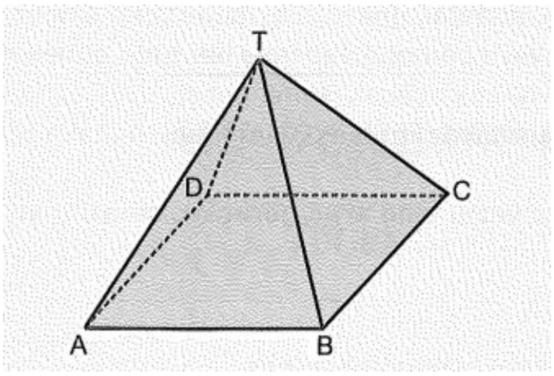
2. Rangli qog‘ozdan yasalgan to‘g‘ri prizmaning tomonlari 2, 8 va 10 birlik. Ikkita shunday prizmalarni rasmdagidek joylashtirildi. Hosil bo‘lgan jismning to‘la sirtini toping.



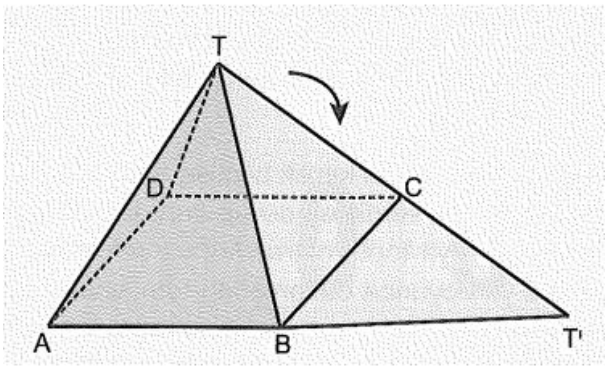
3. Quyidagi rasmda qattiq karton qog‘ozdan yasalgan asosi kvadrat bo‘lgan, to‘g‘ri piramidaning yoyilmasi berilgan. Agar $TH \perp CB, TH = 5\ cm$ va $BC = 6\ cm$ bo‘lsa, butun piramidaning hajmini toping?



4.Quyidagi rasmda to‘rtburchakli qutining asosi kvadratdan iborat. Piramida asosining perimetri 16 cm va balandligi $2\sqrt{3}$ cm ga teng.

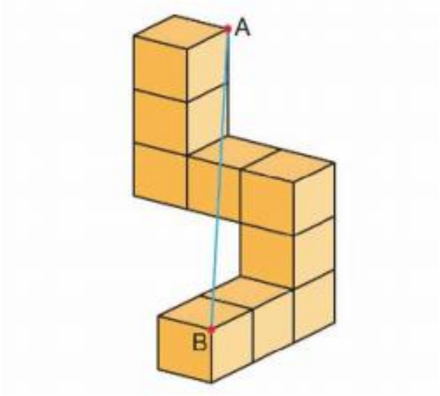


Bu qutining TBC yon yoqi ochilib, ABCD kvadrat bilan bir tekislikka rasmdagidek yoyildi.

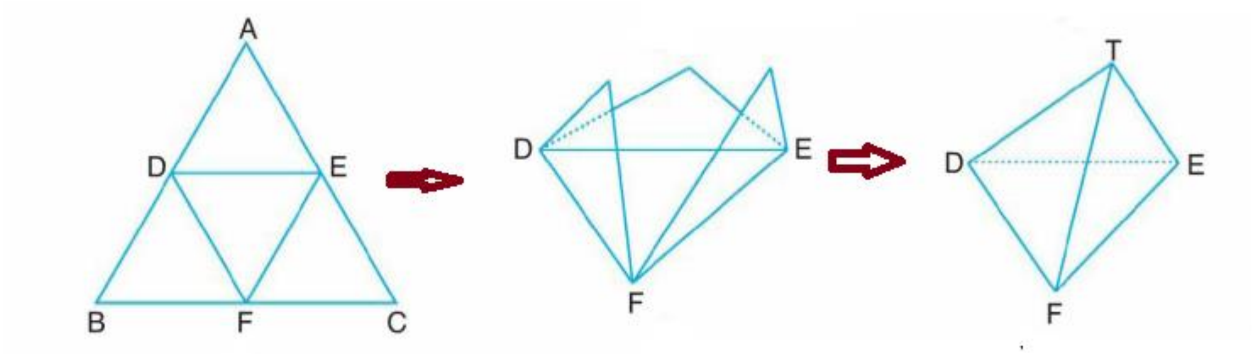


Ushbu hosil bo‘gan rasmdan TT' ni toping.

5. Bir xil 9 ta birlik kubdan quyidagi shakl yasaldi. A va B nuqtalar orasidagi masofani toping.

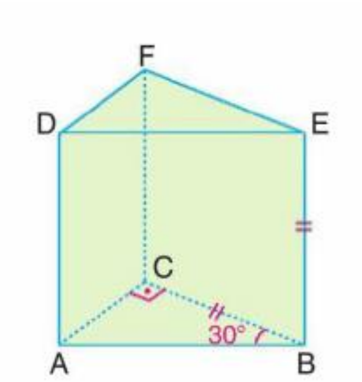


6.Tomoni 12 cm bo‘lgan qog‘ozdan yasalgan teng tomonli uchburchak o‘rtalari D, E va F tutashtirildi va rasmda ko‘rsatilgandek buklanib, to‘g‘ri piramida hosil qilindi.

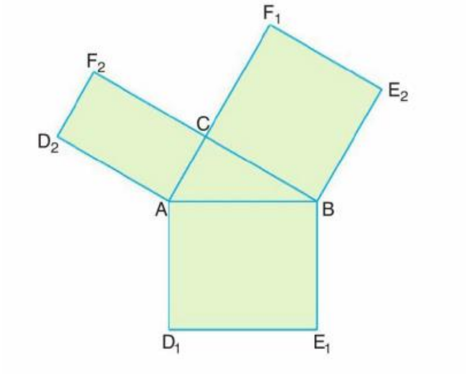


Piramidaning balandligini va to‘la sirti yuzini toping.

7. Kartondan usti ochiq asosi to‘g‘ri burchakli uchburchak bo‘lgan to‘g‘ri prizma yasalgan. Prizmada $\angle ABC = 30^0$ va $BC = BE$ tengliklar berilgan.

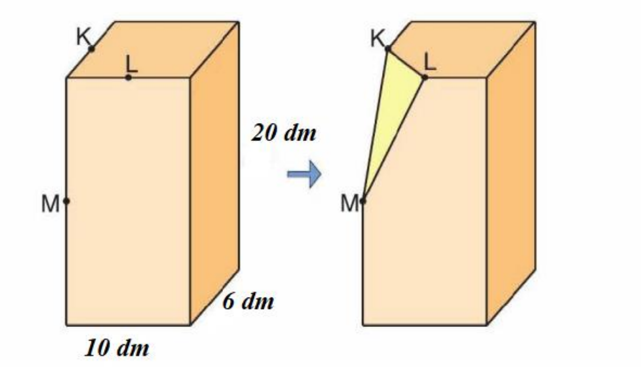


Prizma rasmda ko‘rsatilgandek yoyilganda D_1 va D_2 nuqtalar orasidagi masofa 6 cm bo‘lsa, berilgan prizmaning hajmini toping.

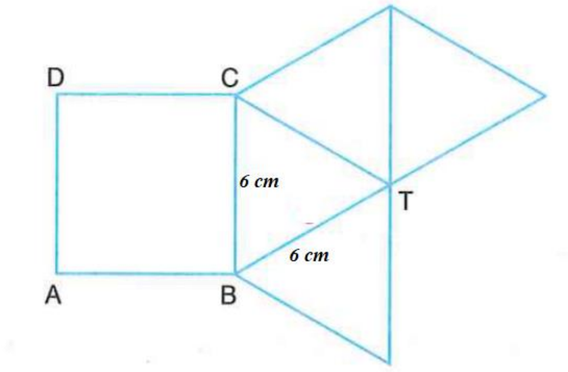


8. Parallelepiped shaklidagi taxtaning o‘lchamlari 6 dm, 10 dm va 20 dm ga teng. Qirralardagi M, L va K nuqtalar ha bir qirraning o‘rtalari bo‘ladi. Yog‘och taxta shu nuqtalardan o‘tuvchi tekislik bo‘yicha arralandi. Hosil bo‘lgan ikki qismlardan

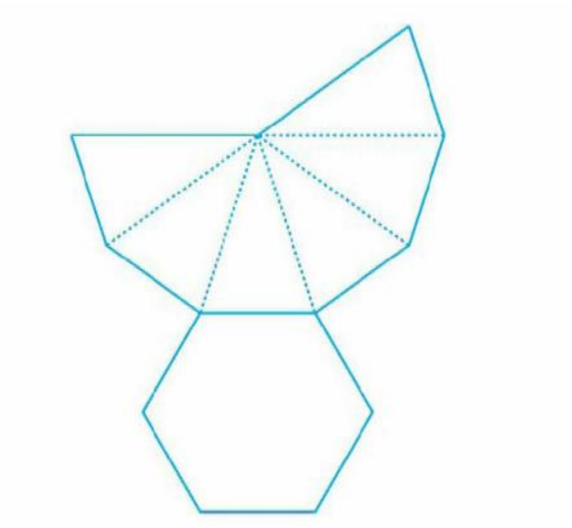
kattasining hajmini toping.



9. Kartondan yasalgan asosi kvadrat bo‘lgan piramidaning yoyilmasi berilgan. Piramida asosining tomoni va yon qirrasi 6 cm ga teng. Kartondan butun piramida hosil qilinsa, uning balandligini toping.

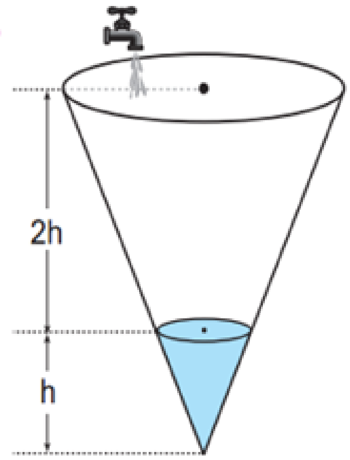


10. Tunukadan yasalgan muntazam olti burchakli piramidaning asosining perimetri $36\ cm$, yon sirti yuzi esa $72\ cm^2$ ga teng. Shu piramida tekislikka yoyilganda rasmdagi shakl hosil bo‘ladi. Shu yoyilmaning perimetrini toping.



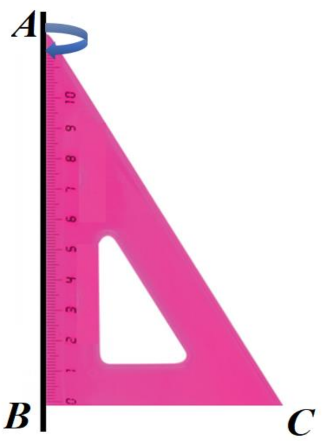
9- savol

1. Rasmda doimiy oqib turuvchi kran, konus jismdagi oynali idishnining h balandlikdagi qismini 4 minutda to‘ldiradi. Bu kran konussimon butun idishni qancha vaqtda to‘ldiradi?

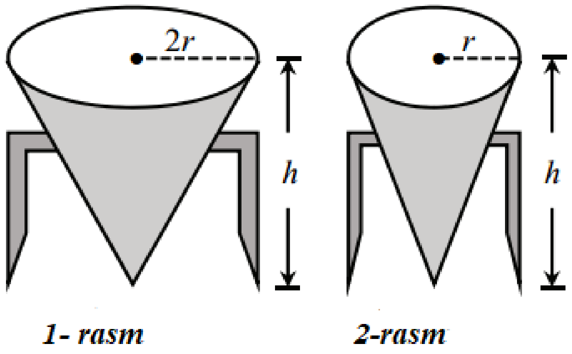


2.Silindr shaklidagi g‘o‘laning balandligi 10 cm, asosining radiusi esa 5 cm. Shu g‘o‘ladan radiusi 3 cm va balandligi 10 cm bo‘lganm rasmdagidek qismi o‘yib olindi. Qolgan qismining to‘la sirtini toping.

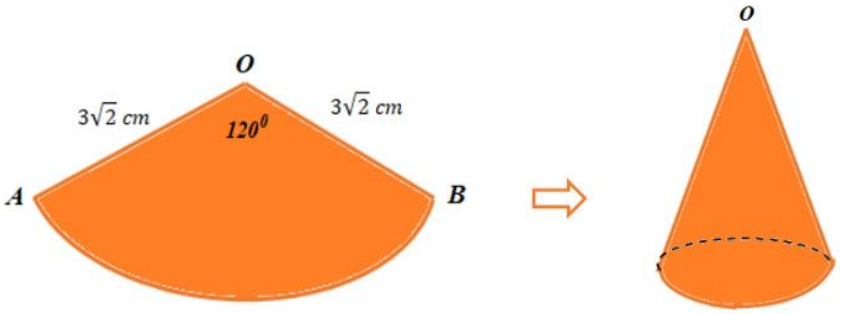
3. Chizg‘ichda $AB = 12\ cm$ va $BC = 9\ cm$ bo‘lib, uni AB o‘qi atrofida aylantirishdan hosil bo‘lgan aylanma jismning yon sirti va hajmini toping?



4. Rasmda ikkita konussimon suv idishlar tasvirlangan. 1-rasmdagi katta ishning radiusi, 2-rasmdagi kichik idishning radiusidan ikki marta katta va balandliklari teng. Agar katta idishga 125 litr suv sig‘sa, kichik idishga qancha suv sig‘ishi mumkin?



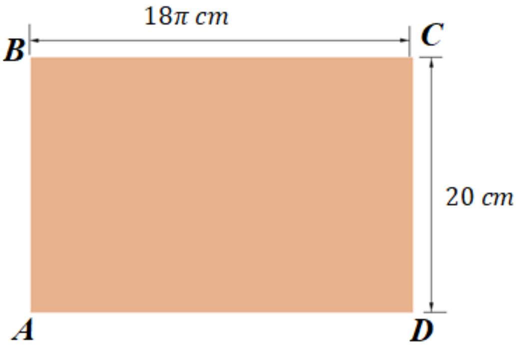
5. Rangli qog‘ozdan yasalgan radiusi $3\sqrt{2}\ cm$ bo‘lgan doiradan, rasmda ko‘rsatilgandek qismi qirqib olindi. Rasmda $AO = OB = 3\sqrt{2}\ cm$ va $\angle AOB = 120^0$ ga teng. A va B nuqtalarni tutashtirib, shu sektordan konus hosil qilingan. Shu konusning hajmini toping.



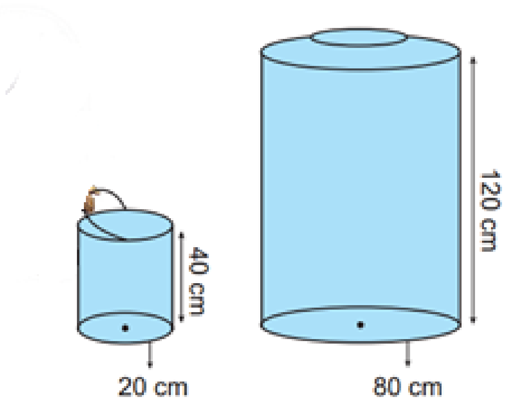
6. Masqarabozning konussimon shapkasi yulduzchalar bilan bezatilgan. Shapkaning balandligi $6\ cm$, diametri $16\ cm$ ga teng. Agar $40\pi\ cm^2$ ga 22 ta yulduzcha yopshtirgan bo‘lsa, shapka qancha yulduzchalar bilan bezatilgan.

7. Diametri 30 cm va uzunligi 1,5 m g‘o‘lani taxta qilib, kesuvchi uskuna yoradmida rasmda ko‘rsatilgandek kesib borildi. Uning o‘rtasiga yetganda, ish to‘xtatildi. Qolgan qismining sirti yuzini toping. Bu yerda $\pi = 3$ ga teng.

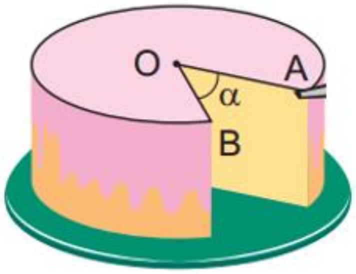
8. To‘g‘ri to‘rtburchak shaklidagi $ABCD$ qog‘ozdan A va D uchlarini tutashtirishdan silindr hosil qilindi. Agar qog‘ozning eni $BC = 18\pi\ cm$, bo‘yi $CD = 20\ cm$ bo‘lsa, hosil qilingan silindr hajmini toping?



9. Jamol silindrsimon chelak bilan silindr ko‘rinishdagi katta suv idishini to‘ldirmoqchi. Agar chelak asosi aylanasi uzunligi 20 cm va balandligi 40 cm, katta idishning asosi aylanasi uzunligi 80 cm, balandligi esa 120 cm bo‘lsa, suv idishni to‘ldirish uchun necha chelak suv quyishi kerak.

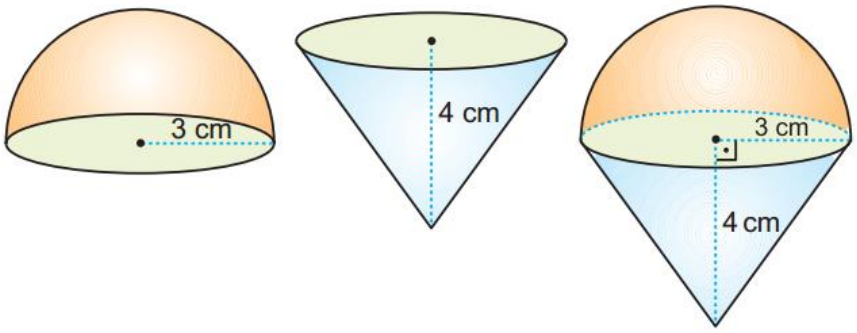


10. To‘lqinning tug‘ilgan kuniga, asosining radiusi 12 cm va balandligi 8 cm bo‘lgan silindr shaklidagi tort olib kelindi. Mehmonlar keguncha qiziga tortdan $192\pi\ cm^3$ hajmdagi qismini kesib berdi. To‘lqin qiziga qanday burchak kattalikdagi qismini kesib bergan.Shu α burchakni toping.



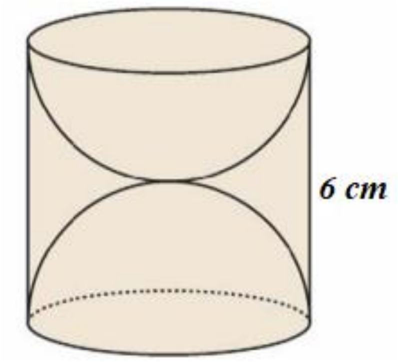
10-savol

1. Radiusi 3 cm yarim shar shaklidaki shokolad bilan asoslari ustma-ust, tushadigan konus shaklidagi shirinlik rasmdagidek joylashtirildi. Agar konusning balandligi 4 cm bo‘lsa, hosil bo‘lgan yangi shirinlikning sirti necha $\pi\ cm^2$ ga teng?



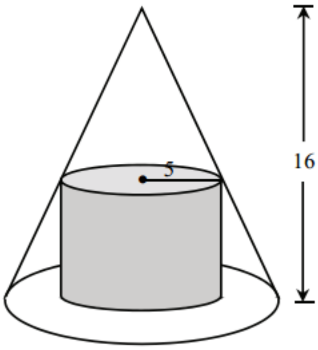
A) 24 B) 26 C) 33 D) 32

2. Yog‘ochdan yasalgan, balandligi 6 cm bo‘lgan to‘g‘ri silindrdan iborat g‘o‘ladan, rasmda ko‘rsatilgandek qilib ikkita yarim shar yo‘nilgan. Qolgan qismining sirtini cm^2 toping?



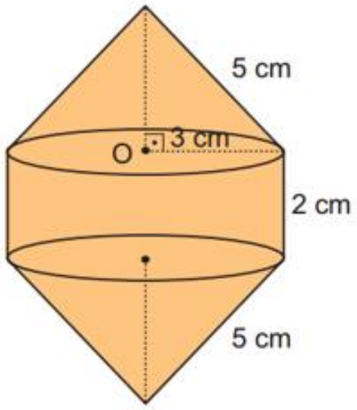
A) $54\,\pi$ B) $63\,\pi$ C) $45\,\pi$ D) $72\,\pi$

3. Konusning balandligi $16\,cm$ asosining radiusi esa, $8\,cm$ ga teng. Konusga ichki chizilgan silindrning radiusi $5\,cm$. Silindr va konus asoslarining markazlari bitta nuqtada bo‘lsa(rasmga qarang), silindrning hajmini toping.



A) $180\,\pi$ B) $150\,\pi$ C) $125\,\pi$ D) $160\,\pi$

4.Metal buyumlardan silindr va konus yasalgan, ularni birlashtirish orqali rasmdagi jism hosil qilindi. Berilgan ma'lumotlardan foydalanib yangi jismning hajmini (cm^3) toping?

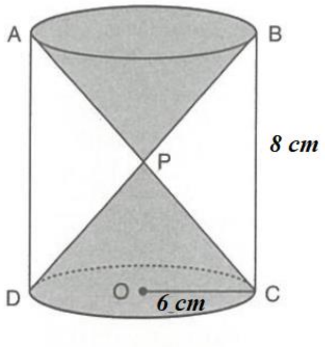


A) $42\,\pi$ B) $43\,\pi$ C) $40\,\pi$ D) $44\,\pi$

5. Parallelepiped shaklidagi plastik qutiga radiusi $4\,cm$ bo'lgan 6 ta bir xil shar shaklidagi archa o'yinchoqlari joylashtirilgan. Agar sharchalar qutiga va bir-biriga tegib turgan bo'lsa, parallelepiped hajmini toping.

A) $3076\,cm^3$ B) $3078\,cm^3$ C) $3072\,cm^3$ D) $3074\,cm^3$

6. Rasmda P nuqta qum soatning o'rta nuqtasi, $BC = 8\,cm$ va $AO = 6\,cm$ bo'lsa, qum soatning hajmini toping.

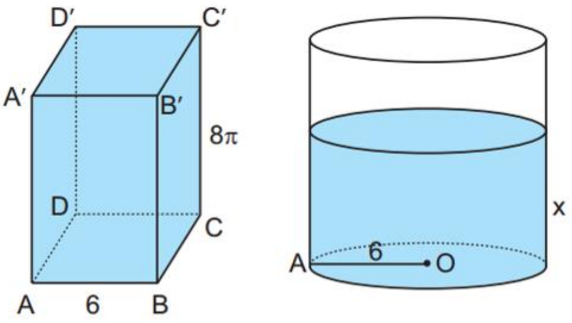


A) $108\,\pi\,cm^3$ B) $96\,\pi\,cm^3$ C) $72\,\pi\,cm^3$ D) $64\,\pi\,cm^3$

7. Shar shaklidagi muzqaymoqning radiusi $6\,cm$, konus shaklidagi shirinlikning balandligi $3\ cm$, radiusi esa $4\ cm$. Munisa konus shaklidagi shirinlikka shar shaklidagi muzqaymoqni eritib quymoqchi, unga konus shaklidagi shirinlikdan nechta kerak?

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

8. Rasmda asosi kvadrat bo‘lgan to‘g‘ri prizma va to‘g‘ri silindr berilgan. Agar prizmaning balandligi 8π va asosining tomoni 6 birlik bo‘lsa, asosining radiusi 6 birlik bo‘lgan silindrga prizmadagi hamma suv quyilsa, silindrdagi suv x birlik balandlikda bo‘ladi. Shu balandlikni toping.



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

9. Ushbu rasmda temir trubaning balandligi $10\,dm$ .Trubaning radiusi 6 dm , suv o‘tadigan trubaning radiusi $4\ dm$. Shu kattalikdagi quvurga qancha dm^3 metal ketgan?

A) $196\,\pi$ B) $200\,\pi$ C) $166\,\pi$ D) $160\,\pi$

10. L shaklidagi klyuch AB qismidan burab yechiladi. Agar $AB = 10\ cm$, silindr radiusi esa 5 cm, uning ichki qism, muntazam oltiburchakning tomoni 2 cm. Silindr shaklidagi qismiga qancha metal ketgan?

A) $250\,\pi - 60\sqrt{3}\ cm^3$ B) $250\,\pi - 80\sqrt{3}\ cm^3$

C) $240\,\pi - 60\sqrt{3}\ cm^3$ D) $240\,\pi - 80\sqrt{3}\ cm^3$