

11 sinf yakuniy imtixon materiallari Algebra va Geometriya topshiriqlari

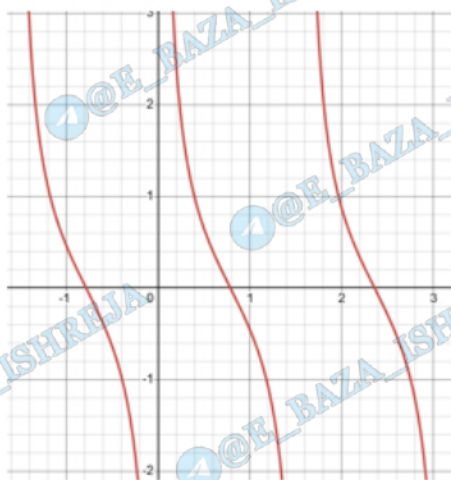
3-variant

1. Ifodaning qiymatini toping:

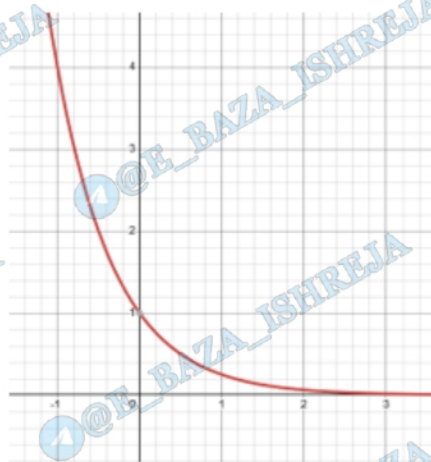
$$\log_6 4 + \log_6 9 + \sqrt[3]{2} \cdot \sqrt[3]{32}.$$

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

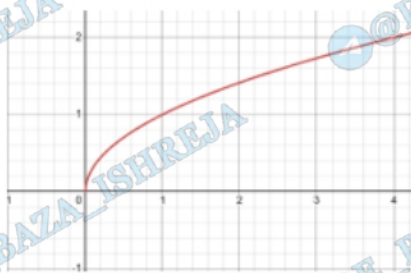
2. Quyida keltirilgan olti funksiya dan to'rttasining grafigi rasmda tasvirlangan. Funktsiyalar va ularning grafigi o'rtasidagi moslikni toping.



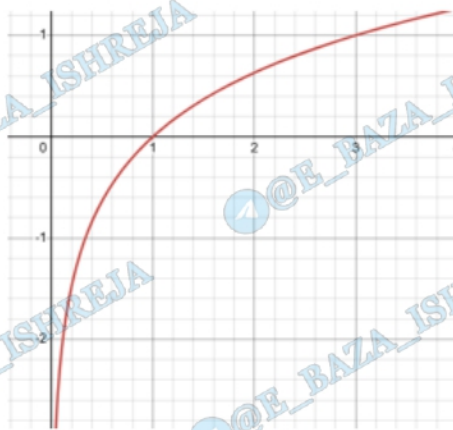
A



B



C



D

Funksiyalar:

1) $y = \log_3 x$	3) $y = \sqrt{x}$	5) $y = \sin 2x$
2) $y = 4^{-x}$	4) $y = \operatorname{ctg} 2x$	6) $y = 2^x$

A	B	C	D
4	2	3	1

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

A) $x > 2$ B) $x < 2$ C) $x > 1$ D) $x < 1$

4. Tenglamani yeching: $\lg(100x) \cdot \lg x = 3$.

Javob: $x_1 = 0.001, x_2 = 10$

5. Tenglamani yeching: $\sin 2x = \sqrt{3} \sin x$.

Javob: $x_1 = \pi n, x_2 = x = \pm 6\pi + 2n\pi (n \in \mathbb{Z})$

6. $y = -x^4 + 2x^2 + 3$ funksiya uchun quyidagilarni toping:

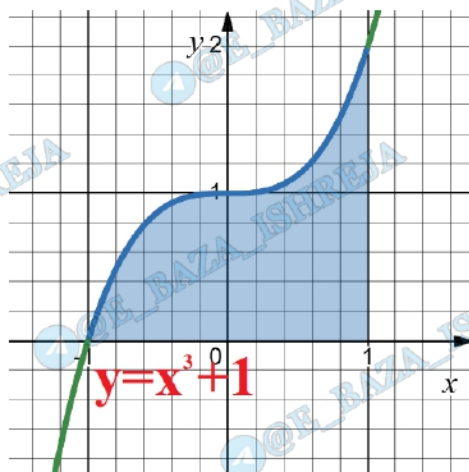
- 1) statsionar nuqtalarini;
- 2) o'sish va kamayish oraliqlarini;
- 3) lokal maksimum va lokal minimumlarini.

Talab	Javob
1. Statsionar nuqtalar	$x=-1, x=0, x=1$
2. O'sish va kamayish oraliqlari	$(-\infty, -1)$ da o'sadi, $(-1, 0)$ da kamayadi, $(0, 1)$ da o'sadi, $(1, +\infty)$ da kamayadi
3. Lokal maksimum va lokal minimum	$(-1, 4)$ — lokal maksimum, $(0, 3)$ — lokal minimum, $(1, 4)$ — lokal maksimum

7. To'g'ri chiziq bo'ylab harakatlanayotgan moddiy nuqtaning tezligi $v(t) = 40t - 2t^2$ qonun bo'yicha o'zgaradi, bu yerda t sekundlarda, v esa m/s da o'lchanadi. Tezlanish $24 m/s^2$ ga teng bo'lgan t vaqt momentini toping.

A) $t = 4$ B) $t = 5$ C) $t = 6$ D) $t = 7$

8. Rasmda $y = 1 + x^3$ funksiyaning grafigi tasvirlangan. Bo'yalgan sohaning yuzini toping.



A) 2 B) 2,5 C) 1,5 D) 1,8

9. Bolalar o'zlarining sport jamoasi uchun nom tanlashmoqchi. Buning uchun qizlar bir qutiga rangli sharchalarni solishdi (qutida har bir rangdagi sharchalar soni jadvalda ko'rsatilgan).

Ranglar	Sharchalar soni
Havorang	9
Qora	10
Kulrang	4
Sariq	3
Ko'k	8
Yashil	4
Oq	12

O'g'il bolalar esa 4 ta qog'ozdan har biriga quyidagi so'zlardan birini yozishdi: "Bo'rilar", "Yo'lbarslar", "Burgutlar", "Lochinlar". Qizlar qutidan tasodifiy bitta sharcha olishdi. O'g'il bolalar esa qog'ozlardan tasodifiy bittasini tanlashdi. Natijada jamoa nomi hosil bo'ladi. Jamoa nomi "Sariq yo'lbarslar" yoki "Qora lochinlar" degan nomlardan birining bo'lish ehtimolligini toping.

A) $\frac{1}{50}$ B) $\frac{13}{200}$ C) $\frac{4}{50}$ D) $\frac{1}{200}$

10. Voleybol jamoasida maydonda bo'lgan o'yinchilarning bo'ylari: 197 cm, 199 cm, 205 cm, 199 cm, 197 cm va 203 cm. Bu sonlar qatorining medianasiga teng bo'lgan bo'yga ega bo'lgan o'yinchi zaxira o'yinchisi bilan almashtirildi. Almashtirishdan so'ng jamoaning o'rtacha bo'yi 1 cm ga oshdi. Almashtirishdan so'ng jamoa o'yinchilarining bo'ylari uzunliklaridan tuzilgan sonli qatorning medianasi qanday o'zgardi?

A) 2 ga kamaydi B) 3 ga oshdi C) 2 ga oshdi D) o'zgarmadi

11. To'g'ri prizmaning asosi tomoni 17 cm ga, diagonallaridan biri 16 cm ga teng bo'lgan rombdan iborat. Agar prizmaning yon qirradi 20 cm ga teng bo'lsa, uning hajmini toping.

Javob: $V = 4800 \text{ cm}^3$

12. Uyning suv quvurlari yangisiga almashtirildi. Yangi quvurning uzunligi eski quvurning uzunligidan 2 marta, diametri esa 1,5 marta katta bo'lsa, yangi quvurning tashqi yuzi eski quvurning tashqi yuzidan necha marta kattalashgan?

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

13. Piramidaning asosi diagonallari 4 cm va 6 cm bo'lgan rombdan iborat bo'lib, piramidaning balandligi romb diagonallarining kesishish nuqtasiga tushadi. Katta yon qirra 5 cm ga teng. Piramidaning hajmini cm^3 da toping.

A) 60 B) 64 C) 18 D) 16

14. Konus yon sirtining yoyilmasi markaziy burchagi 120° bo'lgan sektordan iborat. Konus yasovchisining uning asosi radiusiga nisbatini toping.

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

15. $ABCD A_1 B_1 C_1 D_1$ parallelepipedda F nuqta $A_1 B_1$ qirraning o'rtasi bo'lsa, $\overrightarrow{FD}$ vektorni $\vec{a} = \overrightarrow{AB}$, $\vec{b} = \overrightarrow{AD}$, $\vec{c} = \overrightarrow{AA_1}$ vektorlar orqali ifodalang.

A) $\overrightarrow{FD} = \frac{-\vec{a} + 2\vec{b} - 2\vec{c}}{2}$ B) $\overrightarrow{FD} = \frac{\vec{a} - 2\vec{b} + \vec{c}}{2}$ C) $\overrightarrow{FD} = \frac{\vec{a} + 2\vec{b} - \vec{c}}{2}$ D) $\overrightarrow{FD} = \frac{\vec{a} + 2\vec{b} + 2\vec{c}}{2}$

16. Dizayner bog' fonarlari uchun "uycha" shaklini ya'ni pastki qismi kubdan, yuqori qismi asosi kubning yuqori yog'i bo'lgan muntazam piramidadan iborat bo'lgan jismni tanladi. Uychaning barcha qirralari 20 cm ga teng. Bu fonarchaning to'la sirtini cm^2 da toping.

Javob: $2000 + 400\sqrt{3} \text{ sm}^2$

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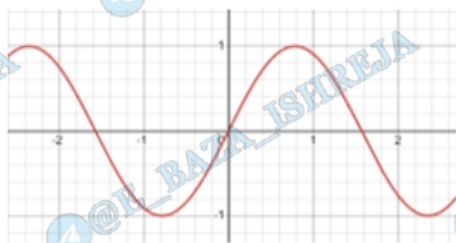
8-variant

1. Ifodaning qiymatini toping:

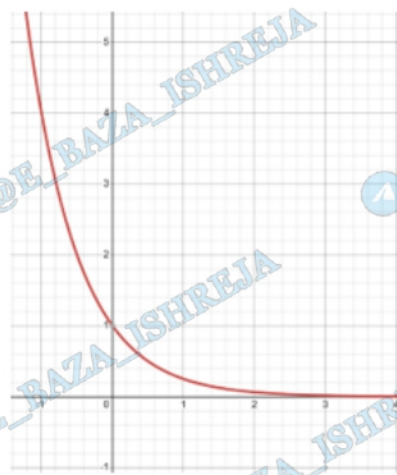
$$\log_{\frac{1}{2}} 4 - \sqrt[3]{5} \cdot \sqrt[3]{25} + \log_6 1.$$

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

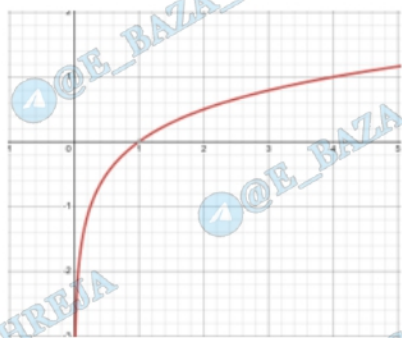
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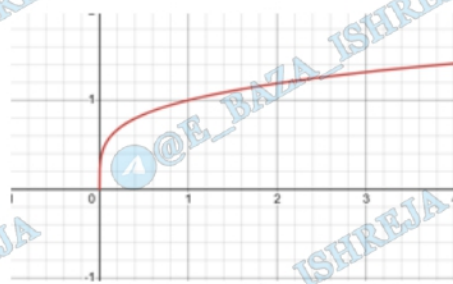
A



B



C



D

Funksiyalar:

1) $y = \log_4 x$	3) $y = \sqrt[4]{x}$	5) $y = \sin 2x$
2) $y = 4^{-x}$	4) $y = \operatorname{tg} 2x$	6) $y = 2^x$

A	B	C	D
5	2	1	3

3. Tenglamani yeching: $9^x - 6 \cdot 3^x = 27$.

A) $x = 2$ B) $x = 2,5$ C) $x = 1$ D) $x = 3$

4. Tengsizlikni yeching: $\log_{0,5}(3x - 4) \geq -1$.

Javob: $x \in (\frac{4}{3}; 2]$

5. Tenglamani yeching: $\operatorname{tg} x + 3 \operatorname{ctg} x = 4$.

Javob: $x_1 = \arctg 3 + n\pi, x_2 = 4\pi + n\pi, (n \in \mathbb{Z})$

6. $y = \frac{1-x^2}{x^2-4}$ funksiya uchun quyidagilarni toping:

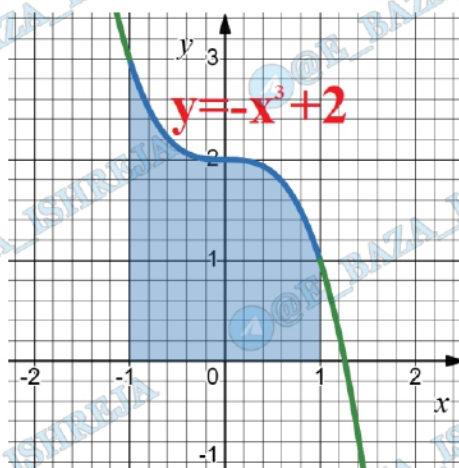
- 1) statsionar nuqtalarini;
- 2) o'sish va kamayish oraliqlarini;
- 3) lokal maksimum va lokal minimumlarini.

Talab	Javob
1. Statsionar nuqtalar	$x=0$
2. O'sish va kamayish oraliqlari	$(-\infty, -2)$ da kamayadi, $(-2, 0)$ da kamayadi, $(0, 2)$ da o'sadi, $(2, +\infty)$ da o'sadi
3. Lokal maksimum va lokal minimum	$(0, -\frac{1}{4})$ — lokal minimum

7. $f(x) = 4\sqrt{6-x}$ funksiya grafigiga $x_0 = 2$ nuqtada o'tkazilgan urinma tenglamasini toping.

A) $y = x - 7$ B) $y = -x + 6$ C) $y = -x + 10$ D) $y = x + 3$

8. Rasmda $y = 2 - x^3$ funksiyaning grafigi tasvirlangan. Bo'yalgan sohaning yuzini toping.



A) 2 B) 5 C) 4 D) 8

9. Bolalar o'zlarining sport jamoasi uchun nom tanlashmoqchi. Buning uchun qizlar bir qutiga rangli sharchalarni solishdi (qutida har bir rangdagi sharchalar soni jadvalda ko'rsatilgan).

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A) $\frac{1}{5}$ B) $\frac{2}{25}$ C) $\frac{4}{5}$ D) $\frac{1}{10}$

10. Amirning kundaligida (100 ballik tizim bo'yicha) baholar quyidagicha edi: 55, 80, 90, 100, 70, 85 va 80. Ma'lum bo'lishicha, birinchi baho noto'g'ri qo'yilgan. Uni to'g'rilagach, baholardan tuzilgan sonlar qatorining medianasi 3 ballga oshdi. Baho tuzatilganidan keyin o'rtacha baho necha ballga oshdi?

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

11. $ABCD A_1 B_1 C_1 D_1$ muntazam to'rtburchakli prizma asosining yuzi 16 cm^2 ga, yon qirasi esa 3 cm ga teng. $ABC_1 D_1$ kesim yuzini toping.

Javob: $S = 20 \text{ cm}^2$

12. Radiusi 50 cm bo'lgan shar sirtini bo'yash uchun shu radiusli silindrning to'la sirtini bo'yash uchun qancha bo'yoq kerak bo'lsa, shuncha bo'yoq kerak bo'ldi. Silindrning balandligini toping.

A) 50 cm B) 45 cm C) 10 cm D) 25 cm

13. Piramidaning asosi tomonlari 10 cm va 24 cm bo'lgan to'g'ri to'rtburchakdan iborat. Piramidaning barcha yon qirralari $\sqrt{269} \text{ cm}$ ga teng. Piramidaning hajmini cm^3 da toping.

A) 800 B) 960 C) 480 D) 320

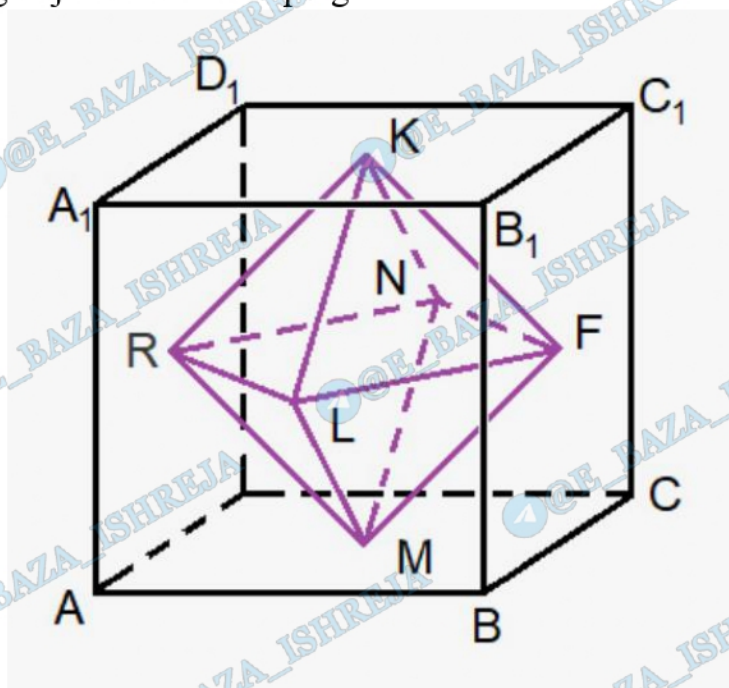
14. Konusning o'q kesimi yuzi 12 cm^2 ga teng bo'lgan to'g'ri burchakli uchburchakdan iborat. Ushbu konusning hajmini cm^3 da toping. ($\pi = 3,14$ deb oling).

- A) $12,56\sqrt{3}$ B) $25,12\sqrt{3}$ C) $6,28\sqrt{3}$ D) $37,68\sqrt{3}$

15. Fazoda $A(5; 6; 2)$, $B(-1; -2; 0)$, $C(3; 0; -4)$ nuqtalar berilgan. N nuqta AB kesmaning o'rtasi bo'lsa, $\overrightarrow{CN}$ vektorining koordinatalarini toping.

- A) $\overrightarrow{CN}(5; 4; 0)$ B) $\overrightarrow{CN}(-1; 2; 5)$ C) $\overrightarrow{CN}(8; 1; -2)$ D) $\overrightarrow{CN}(-8; -1; 2)$

16. Kubda yoqlarning o'rtalari tutashtirildi va oktaedr hosil qilindi (bu ko'pyoq umumiy asosga ega bo'lgan ikkita to'rtburchakli piramidadan iborat). Oktaedrning qirrasi 4 dm ga teng. Kubning hajmini dm^3 da toping.



Javob: $\frac{32}{3} \text{ sm}^3$