
IDC

# MATEMATIKA

## III QISM

## 2024

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# MATEMATIKA
# III qism
## Abituriyentlar uchun

**Qayta ishlangan va to‘ldirilgan ikkinchi nashri**

Toshkent 2024

# Mundarija

# 7. Keltirish formulalari. Uchburchakda sinuslar va kosinuslar teoremasi

**1-15. Keltirish formulalaridan foydalanib soddalashtiring.**

**1** $\sin\left(\frac{\pi}{2}-\alpha\right)$

**2** $\cos\left(\frac{3\pi}{2}+\alpha\right)$

**3** $\sin(\pi-\alpha)$

**4** $\text{tg}(180^\circ-\alpha)$

**5** $\text{ctg}(270^\circ+\alpha)$

**6** $\cos(180^\circ+\alpha)$

**7** $\text{ctg}(180^\circ+\alpha)$

**8** $\text{tg}(270^\circ+\alpha)$

**9** $\text{tg}(540^\circ+\alpha)$

**10** $\sin(11\pi-\alpha)$

**11-30. Keltirish formulalaridan foydalanib soddalashtiring.**

**11** $\cos(\alpha-180^\circ)$

**12** $\sin(\alpha-90^\circ)$

**13** $\sin(\alpha-270^\circ)$

**14** $\text{tg}(\alpha-180^\circ)$

**15** $\text{ctg}(\alpha-270^\circ)$

**16** $\sin(\alpha-7\pi)$

**17** $\sin(\alpha-1800^\circ)$

**18** $\cos(\alpha-360^\circ)$

**19** $\sin(\alpha-\frac{21\pi}{2})$

**20** $\cos(\alpha-720^\circ)$

**21** $\cos(\alpha - 7\pi)$

**22** $\cos(\alpha - 270^\circ)$

**23** $\cos(\alpha - \frac{21\pi}{2})$

**24** $\text{tg}(\alpha - 180^\circ)$

**25** $\text{tg}(\alpha - 720^\circ)$

**26** $\text{tg}(\alpha - 90^\circ)$

**27** $\text{tg}(\alpha - 270^\circ)$

**28** $\text{ctg}(\alpha - 12\pi)$

**29** $\text{ctg}(\alpha - 1170^\circ)$

**30** $\text{ctg}(\alpha - \frac{19\pi}{2})$

**31-40. Keltirish formulalaridan foydalanib hisoblang.**

**31** $\sin 135^\circ$

**32** $\cos 120^\circ$

**33** $\text{tg}300^\circ$

**34** $\cos 330^\circ$

**35** $\sin 120^\circ$

**36** $\cos 150^\circ$

**37** $\text{tg}210^\circ$

**38** $\text{ctg}135^\circ$

**39** $\sin 150^\circ$

**40** $\text{ctg}315^\circ$

**41** $\sin\left(-\frac{11\pi}{6}\right)$

**42** $\cos\frac{7\pi}{6}$

**43** $\text{tg}\frac{31\pi}{4}$

**44** $\sin(-7\pi)+2\cos\frac{31\pi}{3}-\text{tg}\frac{7\pi}{4}$

**45** $\cos(-9\pi)+2\sin\left(-\frac{49\pi}{6}\right)-\text{ctg}\left(-\frac{31\pi}{4}\right)$

**41-65. Keltirish formulalaridan foydalanib hisoblang.**

**46** $\frac{\sin 47^\circ}{\cos\ 137^\circ}$

**47** $\frac{\sin 57^\circ}{\cos 33^\circ}$

**48** $\frac{\cos 158^\circ}{\cos 22^\circ}$

**49** $\frac{\sin 164^\circ}{\cos 106^\circ}$

**50** $\frac{\sin 187^\circ}{\cos 263^\circ}$

**51** $\dfrac{\sin 19^\circ}{\sin 161^\circ} \cdot \dfrac{\cos 71^\circ}{\cos 289^\circ}$

**52** $\dfrac{\sin 17^\circ \cdot \cos 46^\circ}{\sin 163^\circ \cdot \sin 136^\circ}$

**53** $\dfrac{\sin 2^\circ \cdot \cos 13^\circ \cdot \mathrm{tg}15^\circ}{\mathrm{ctg}75^\circ \cdot \cos 88^\circ \cdot \cos 193^\circ}$

**54** $\dfrac{\mathrm{tg}78^\circ}{\mathrm{ctg}12^\circ} + \dfrac{\sin 78^\circ}{\cos 12^\circ} + \dfrac{\mathrm{tg}79^\circ}{\mathrm{ctg}11^\circ} + \dfrac{\cos 11^\circ}{\sin 79^\circ}$

**55** $\dfrac{\sin 24^\circ}{\cos 294^\circ} + \dfrac{\mathrm{tg}24^\circ}{\mathrm{ctg}294^\circ} - \dfrac{\cos 24^\circ}{\sin 294^\circ}$

**56** $\dfrac{3\cos 197^\circ + 15\cos 163^\circ}{6\cos 17^\circ}$

**57** $\dfrac{5\sin 247^\circ + 15\sin 113^\circ}{\sin 67^\circ}$

**58** $\dfrac{9\sin 153^\circ + 5\cos 117^\circ}{\sin 27^\circ}$

**59** $\dfrac{11\sin 115^\circ + 2\cos 335^\circ}{\cos 25^\circ}$

**60** $\dfrac{16\sin 241^\circ - 10\cos 151^\circ}{\cos 29^\circ}$

**61** $\sin^2 11^\circ + \sin^2 79^\circ$

**62** $\sin^2 42^\circ + \sin^2 48^\circ$

**63** $\cos^2 98^\circ + \cos^2 8^\circ$

**64** $\cos^2 102^\circ + \cos^2 12^\circ$

**65** $\sin^2 316^\circ + \sin^2 226^\circ$

**66-86. Soddalashtiring.**

**66** $\sin(90^\circ - \alpha) + \cos(180^\circ + \alpha) + \operatorname{tg}(270^\circ + \alpha) + \operatorname{ctg}(360^\circ + \alpha)$

**67** $\sin(\frac{\pi}{2} + \alpha) - \cos(\pi - \alpha) + \operatorname{tg}(\pi - \alpha) + \operatorname{ctg}(\frac{5\pi}{2} - \alpha)$

**68** $\dfrac{\cos(180^\circ + \alpha)\cos(-\alpha)}{\sin(-\alpha)\sin(90^\circ + \alpha)}$

**69** $\dfrac{\sin(-\alpha)\operatorname{ctg}(-\alpha)}{\cos(360^\circ - \alpha)\operatorname{tg}(180^\circ + \alpha)}$

**70** $\dfrac{\sin(\pi-\alpha)\cos(2\pi-\alpha)}{\operatorname{tg}(\pi-\alpha)\cos(\pi-\alpha)}$

**71** $\dfrac{\sin(\pi+\alpha)\sin(2\pi+\alpha)}{\operatorname{tg}(\pi+\alpha)\cos\left(\dfrac{3\pi}{2}+\alpha\right)}$

**72** $\dfrac{\cos(\pi-\alpha)+\cos\left(\dfrac{\pi}{2}-\alpha\right)}{\sin(2\pi-\alpha)-\sin\left(\dfrac{3\pi}{2}-\alpha\right)}$

**73** $\sin^2\left(\dfrac{3\pi}{2}-\alpha\right)+\cos^2\left(\dfrac{17\pi}{2}-\alpha\right)$

**74** $\sin^2\left(\dfrac{35\pi}{2}-\alpha\right)+\cos^2\left(\dfrac{7\pi}{2}-\alpha\right)$

**75** $\operatorname{tg}\left(\dfrac{47\pi}{2}-\alpha\right)\cdot\operatorname{ctg}\left(\dfrac{49\pi}{2}-\alpha\right)$

**76** $\operatorname{tg}\left(\dfrac{21\pi}{2}-\alpha\right)\cdot\operatorname{ctg}\left(\dfrac{23\pi}{2}-\alpha\right)$

**77** $\operatorname{tg}\left(\dfrac{21\pi}{2}+\alpha\right)\cdot\operatorname{ctg}\left(\dfrac{23\pi}{2}+\alpha\right)$

**78** $\dfrac{\sin(51\pi+\alpha)+\sin(50\pi-\alpha)}{\sin\left(-\alpha-\dfrac{\pi}{2}\right)-\cos(-\alpha)}$

**79** $\dfrac{\sin^2(\pi-\alpha)+\sin^2\left(\frac{\pi}{2}-\alpha\right)}{\sin(\pi-\alpha)}\cdot \operatorname{tg}(\pi-\alpha)$

**80** $\dfrac{\sin^2\left(\alpha-\frac{3\pi}{2}\right)\cos(2\pi-\alpha)}{\operatorname{tg}^2\left(\alpha-\frac{\pi}{2}\right)\cos^2\left(\alpha-\frac{3\pi}{2}\right)}$

**81** $\sin^2 2(\pi+1)+\cos^2 2(\pi-1)$

**82** $5\operatorname{tg}^2 2(\pi-1)\cdot \operatorname{ctg}^2 2(\pi+1)$

**83** $\dfrac{\cos(125^\circ-\alpha)}{\sin(\alpha-35^\circ)}$

**84** $\dfrac{\sin(148^\circ-\alpha)}{\cos(58^\circ-\alpha)}$

**85** $\dfrac{\cos(136^\circ+\alpha)}{\sin(46^\circ+\alpha)}$

**87-95. Ifodaning qiymatini toping.**

**86** $0<\alpha<\dfrac{\pi}{2}$ va $\sin\alpha=\dfrac{1}{3}$ bo‘lsa, $\cos(270^\circ-\alpha)$

**87** $0<\alpha<\dfrac{\pi}{2}$ va $\sin\alpha=\dfrac{3}{5}$ bo‘lsa, $\operatorname{tg}(180^\circ-\alpha)$

**88** $0<\alpha<\dfrac{\pi}{2}$ va $cos\alpha=\dfrac{1}{2}$ bo‘lsa, $\operatorname{ctg}(360^\circ-\alpha)$

**89** $0 < \alpha < \frac{\pi}{2}$ va $\text{tg}\alpha = \frac{1}{4}$ bo'lsa, $\sin(270^\circ - \alpha)$

**90** $\pi < \alpha < \frac{3\pi}{2}$ va $\cos\alpha = -\frac{1}{3}$ bo'lsa, $\text{tg}(270^\circ + \alpha)$

**91** $\frac{\pi}{2} < \alpha < \pi$ va $\text{tg}\alpha = -\frac{2}{5}$ bo'lsa, $\cos(180^\circ - \alpha)$

**92** $0 < \alpha < \frac{\pi}{2}$ va $\text{tg}\alpha = \frac{2}{3}$ bo'lsa, $\cos(270^\circ + \alpha)$

**93** $0 < \alpha < \frac{\pi}{2}$ va $\cos\alpha = \frac{2}{\sqrt{7}}$ bo'lsa, $\text{tg}(180^\circ + \alpha)$

**94** $0 < \alpha < \frac{\pi}{2}$ va $\text{tg}\alpha = \frac{3}{4}$ bo'lsa, $\sin(270^\circ - \alpha) + \cos(90^\circ + \alpha)$

**95** $0 < \alpha < \pi$ va $\cos\alpha = -\frac{3}{4}$ bo'lsa, $\sin(-\alpha) + \cos(270^\circ + \alpha)$

**96** $x + y = 90^\circ$ bo'lsa, $\dfrac{\cos(2x + y) + \sin(3x + 2y)}{\cos y}$

**97** $x + y = 180^\circ$ bo'lsa, $\dfrac{\sin(2x + 3y) - \sin(3x + 2y)}{\cos(x + 2y)}$

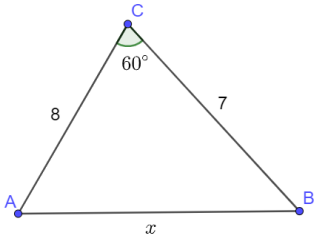
**98** $x+y=0^\circ$ bo'lsa,

$$\frac{\cos(2x+3y)+\sin(3x+2y)}{\cos(y)+\sin(-2x-3y)}$$

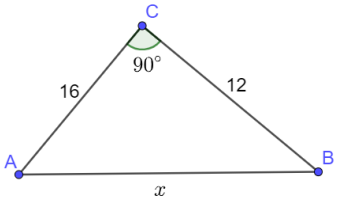
**99** $x+y=-90^\circ$ bo'lsa,

$$\frac{\cos(x+2y)+\sin(-2x-y)}{\cos y}$$

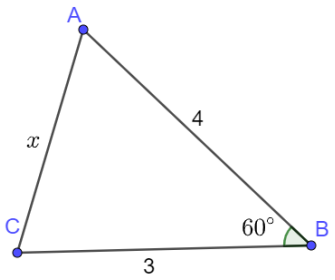
**100** $ABC$ uchburchakda $AC=8$, $BC=7$ va $\angle ACB=60^\circ$ bo'lsa, $AB=?$



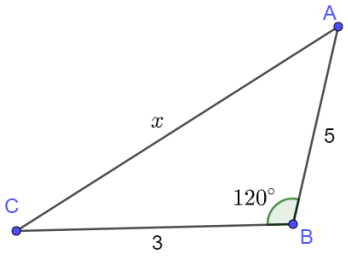

**101** $ABC$ uchburchakda $AC=16$, $CB=12$ va $\angle ACB=90^\circ$ bo'lsa, $AB=?$



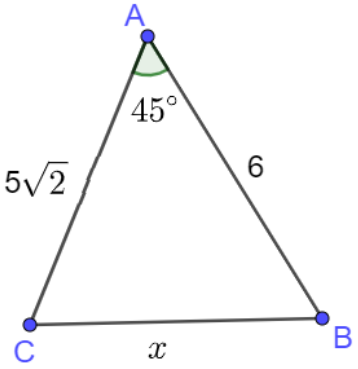

**102** $ABC$ uchburchakda $AB=4$, $CB=3$ va $\angle ABC=60^\circ$ bo'lsa, $AC=?$




**103** $ABC$ uchburchakda $AB=5$, $CB=3$ va $\angle ABC=120^\circ$ bo'lsa, $AC=?$

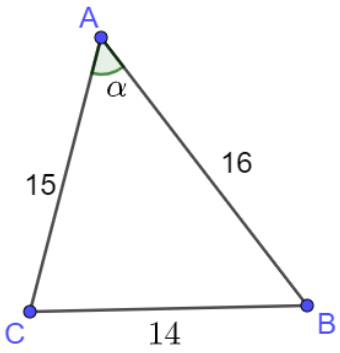



**104** $ABC$ uchburchakda $AC=5\sqrt{2}$, $AB=6$ va $\angle CAB=45^\circ$ bo'lsa, $CB=?$

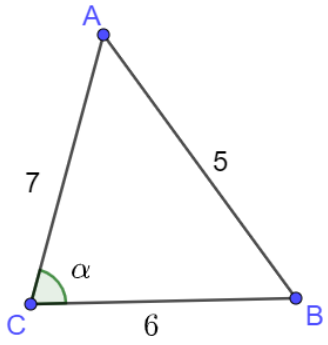


## 7. KELTIRISH FORMULALARI. UCHBURCHAKDA SINUSLAR VA KOSINUSLAR TEOREMASI

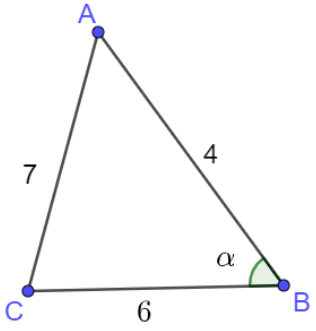
**105** $ABC$ uchburchakda $AB = 16$, $BC = 14$ va $AC = 15$ bo‘lsa, $CAB$ burchak kosinusini toping.



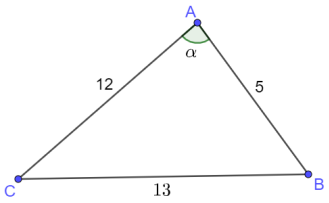

**106** $ABC$ uchburchakda $AB = 5$, $BC = 6$ va $AC = 7$ bo‘lsa, $ACB$ burchak sinusini toping.



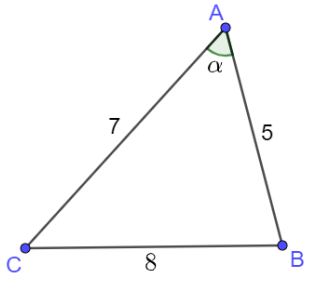

**107** $ABC$ uchburchakda $AB = 4$, $BC = 6$ va $AC = 7$ bo‘lsa, $ABC$ burchak tangensini toping.



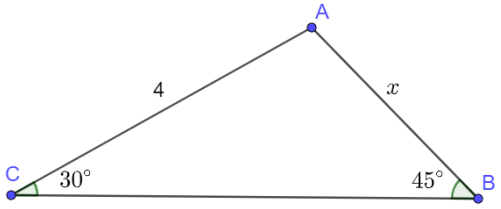

**108** $ABC$ uchburchakda $AB = 5$, $BC = 13$ va $AC = 12$ bo‘lsa, $CAB$ burchak sinusini toping.



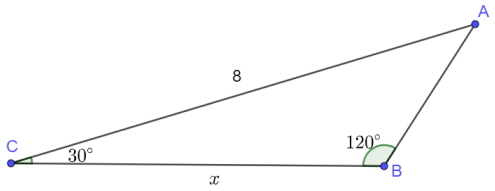

**109** $ABC$ uchburchakda $AB = 5$, $BC = 8$ va $AC = 7$ bo‘lsa, $CAB$ burchak tangensini toping.



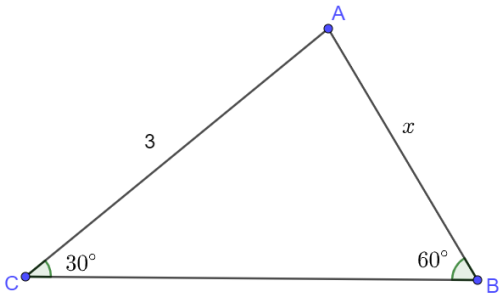

**110** ABC uchburchakda AC=4, $\angle ACB = 30°$ va $\angle ABC = 45°$; $AB$ =?



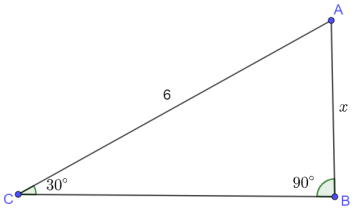
**111** ABC uchburchakda AC=8, $\angle ACB = 30^\circ$ va $\angle ABC = 120^\circ$ bo‘lsa, BC kesma uzunligini toping.



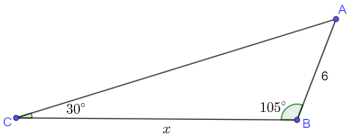

**112** ABC uchburchakda AC=3, $\angle ACB = 30^\circ$ va $\angle ABC = 60^\circ$ bo‘lsa, AB kesma uzunligini toping.



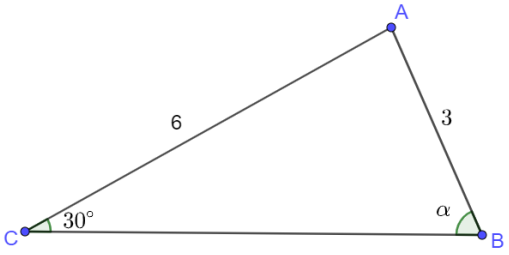

**113** ABC uchburchakda AC=6, $\angle ACB = 30^\circ$ va $\angle ABC = 90^\circ$ bo‘lsa, AB kesma uzunligini toping.



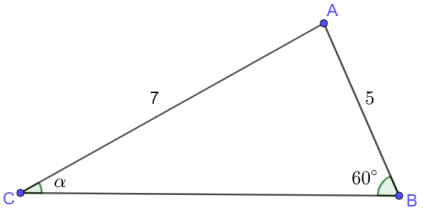

**114** ABC uchburchakda AB=6, $\angle ACB = 30^\circ$ va $\angle ABC = 105^\circ$ bo‘lsa, BC kesma uzunligini toping.




**115** ABC uchburchakda AC=6, AB=3 va $\angle ACB = 30^\circ$ bo‘lsa, ABC burchakning sinusini toping.

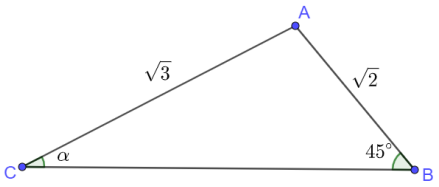



**116** ABC uchburchakda AC=7, AB=5 va $\angle ABC = 60^\circ$ bo‘lsa, ACB burchakning kosinusini toping.

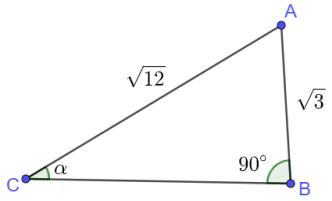


## 7. KELTIRISH FORMULALARI. UCHBURCHAKDA SINUSLAR VA KOSINUSLAR TEOREMASI

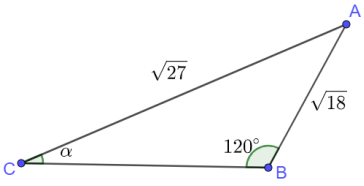
**117** ABC uchburchakda AC=$\sqrt{3}$, AB=$\sqrt{2}$ va $\angle ABC = 45^\circ$ bo‘lsa, ACB burchakning tangensini toping.




**118** ABC uchburchakda AC=$\sqrt{12}$, AB=$\sqrt{3}$ va $\angle ABC = 90^\circ$ bo‘lsa, ACB burchakning kotangensini toping.




**119** ABC uchburchakda AC=$\sqrt{27}$, AB=$\sqrt{18}$ va $\angle ABC = 120^\circ$ bo‘lsa, ACB burchakning kosinusini toping.




**120** $\dfrac{\sin 1^\circ \cdot \sin 2^\circ \sin 3^\circ \ldots \sin 89^\circ}{\cos 1^\circ \cdot \cos 2^\circ \cos 3^\circ \ldots \cos 89^\circ}$

**121** $\dfrac{\sin 91^\circ \cdot \sin 92^\circ \cdot \sin 93^\circ \cdot \ldots \cdot \sin 179^\circ}{\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \cdot \ldots \cdot \cos 89^\circ}$

**122** $\dfrac{\mathrm{tg}11^\circ \cdot \mathrm{tg}13^\circ \mathrm{tg}15^\circ \cdot \ldots \cdot \mathrm{tg}89^\circ}{\mathrm{ctg}101^\circ \cdot \mathrm{ctg}103^\circ \cdot \mathrm{ctg}105^\circ \cdot \ldots \cdot \mathrm{ctg}179^\circ}$

**123** $\lg \mathrm{tg}22^\circ + \lg \mathrm{tg}68^\circ$

**124** $\lg \mathrm{tg}42^\circ + \lg \sin 48^\circ - \lg \cos(-48^\circ)$

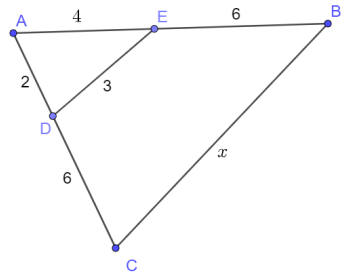
**125** $\lg \mathrm{tg}27^\circ + \lg \sin 117^\circ - \lg \sin 153^\circ$

**126** Hisoblang: $\cos^2 1^\circ + \cos^2 2^\circ + ... + \cos^2 89^\circ$

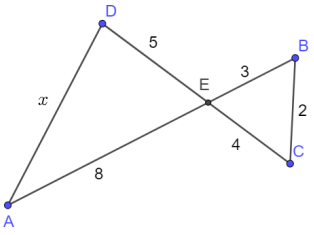
**127** Hisoblang: $\sin^2 1^\circ + \sin^2 2^\circ + ... + \sin^2 360^\circ$

**Iqtidorli o‘quvchilar uchun**

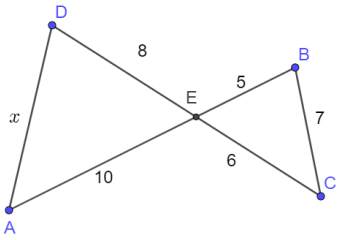
**128** Chizmada berilganlarga ko‘ra BC kesma uzunligini toping.



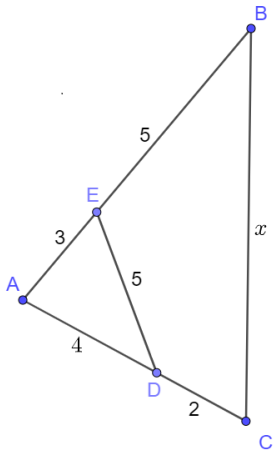

**129** Chizmada berilganlarga ko‘ra AD kesma uzunligini toping.



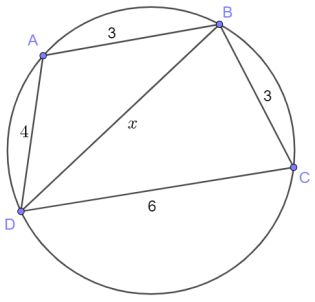

**130** Chizmada berilganlarga ko‘ra AD kesma uzunligini toping.




**131** Chizmada berilganlarga ko‘ra BC kesma uzunligini toping.

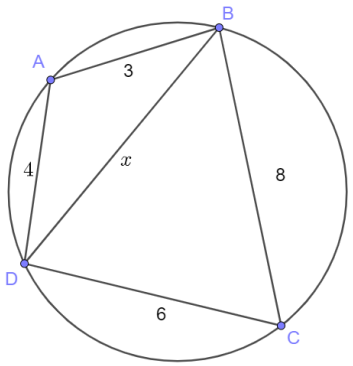



**132** Chizmada berilganlarga ko‘ra BD kesma uzunligini toping.

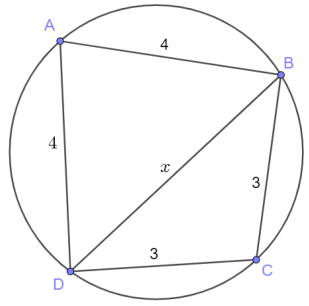


## 7. KELTIRISH FORMULALARI. UCHBURCHAKDA SINUSLAR VA KOSINUSLAR TEOREMASI

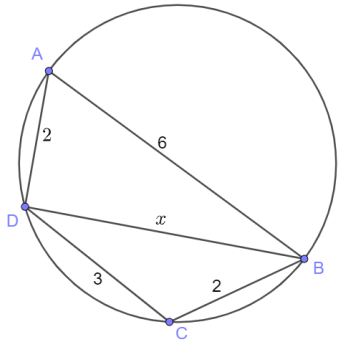
**133** Chizmada berilganlarga ko‘ra BD kesma uzunligini toping.




**134** Chizmada berilganlarga ko‘ra BD kesma uzunligini toping.




**135** Chizmada berilganlarga ko‘ra BD kesma uzunligini toping.




**136** $n$ natural sonning qanday qiymatida $\text{tg}1^\circ\text{tg}2^\circ ... \text{tg}n^\circ = 1$ tenglik bajariladi?

**137** $n$ natural sonining 1000 dan kichik nechta qiymatida $\sin 1^\circ + \sin 2^\circ + ... \sin n^\circ = 0$ tenglik bajariladi?

**138** $n$ natural sonining 1000 dan kichik nechta qiymatida $\cos 1^\circ + \cos 2^\circ + ... \cos n^\circ = 0$ tenglik bajariladi?

# JAVOBLAR

**1.** $\cos\alpha$
**2.** $\sin\alpha$
**3.** $\sin\alpha$
**4.** $-\operatorname{tg}\alpha$
**5.** $-\operatorname{tg}\alpha$
**6.** $-\cos\alpha$
**7.** $\operatorname{ctg}\alpha$
**8.** $-\operatorname{ctg}\alpha$
**9.** $\operatorname{tg}\alpha$
**10.** $\sin\alpha$
**11.** $-\cos\alpha$
**12.** $-\cos\alpha$
**13.** $\cos\alpha$
**14.** $\operatorname{tg}\alpha$
**15.** $-\operatorname{tg}\alpha$
**16.** $-\sin\alpha$
**17.** $\sin\alpha$
**18.** $\cos\alpha$
**19.** $-\cos\alpha$
**20.** $\cos\alpha$
**21.** $-\cos\alpha$
**22.** $-\sin\alpha$
**23.** $\sin\alpha$
**24.** $\operatorname{tg}\alpha$
**25.** $\operatorname{tg}\alpha$
**26.** $-\operatorname{ctg}\alpha$
**27.** $-\operatorname{ctg}\alpha$
**28.** $\operatorname{ctg}\alpha$
**29.** $-\operatorname{tg}\alpha$
**30.** $-\operatorname{tg}\alpha$
**31.** $\frac{\sqrt{2}}{2}$
**32.** $-\frac{1}{2}$
**33.** $-\sqrt{3}$
**34.** $\frac{\sqrt{3}}{2}$
**35.** $\frac{\sqrt{3}}{2}$
**36.** $-\frac{\sqrt{3}}{2}$
**37.** $\frac{1}{\sqrt{3}}$
**38.** $-1$
**39.** $\frac{1}{2}$
**40.** $-1$
**41.** $\frac{1}{2}$
**42.** $-\frac{\sqrt{3}}{2}$
**43.** $-1$
**44.** $2$
**45.** $-3$
**46.** $-1$
**47.** $1$
**48.** $-1$
**49.** $-1$
**50.** $1$
**51.** $1$
**52.** $1$
**53.** $-1$
**54.** $4$
**55.** $1$
**56.** $-3$
**57.** $10$
**58.** $4$
**59.** $13$
**60.** $-6$
**61.** $1$
**62.** $1$
**63.** $1$
**64.** $1$
**65.** $1$
**66.** $0$
**67.** $2\cos\alpha$
**68.** $\operatorname{ctg}\alpha$
**69.** $\operatorname{ctg}\alpha$
**70.** $\cos\alpha$
**71.** $-\cos\alpha$
**72.** $-1$
**73.** $1$
**74.** $1$
**75.** $1$
**76.** $1$
**77.** $1$
**78.** $\operatorname{tg}\alpha$
**79.** $-\frac{1}{\cos\alpha}$
**80.** $\cos\alpha$
**81.** $1$
**82.** $5$
**83.** $1$
**84.** $1$
**85.** $-1$
**86.** $-\frac{1}{3}$
**87.** $-\frac{3}{4}$
**88.** $-\frac{1}{\sqrt{3}}$
**89.** $-\frac{4}{\sqrt{17}}$
**90.** $-\frac{\sqrt{2}}{4}$
**91.** $\frac{5}{\sqrt{29}}$
**92.** $\frac{2}{\sqrt{13}}$
**93.** $\frac{\sqrt{3}}{2}$
**94.** $-1,4$
**95.** $0$
**96.** $-2$
**97.** $0$
**98.** $1$
**99.** $0$
**100.** $\sqrt{57}$
**101.** $20$
**102.** $\sqrt{13}$
**103.** $\sqrt{26}$
**104.** $\frac{19}{32}$
**105.** $\frac{\sqrt{24}}{7}$
**106.** $\sqrt{255}$
**107.** $1$
**108.** $4\sqrt{3}$
**109.** $2\sqrt{2}$
**110.** $\frac{8\sqrt{3}}{3}$
**111.** $\sqrt{3}$
**112.** $3$
**113.** $6\sqrt{2}$
**114.** $1$
**115.** $\frac{11}{14}$
**116.** $\frac{\sqrt{2}}{2}$
**117.** $\sqrt{3}$
**118.** $\frac{\sqrt{2}}{2}$
**119.** $1$
**120.** $1$
**121.** $1$
**122.** $0$
**123.** $0$
**124.** $0$
**125.** $44\frac{1}{2}$
**126.** $180$
**127.** $3\sqrt{6}$
**128.** $\sqrt{19}$
**129.** $2\sqrt{33}$
**130.** $10$
**131.** $\sqrt{33}$
**132.** $2\sqrt{10}$
**133.** $\frac{24}{5}$
**134.** $\sqrt{22}$
**135.** $89$
**136.** $4$
**137.** $5$

**Mavzuga doir murakkab masalalar yechilish usullari bilan tanishish uchun QR code ni skanerlang yoki suratga olib, *@idcuzbot* ga yuboring.**

# Qaydlar uchun

# 4-7-mavzular bo'yicha takrorlash testi

**1** $2-3\sin\frac{7\pi}{6}+\sqrt{2}\cos\frac{3\pi}{4}$ ifodaning qiymatini toping.
A)$-2,5$ B)$1,5$ C)$2,5$ D)$3,5$

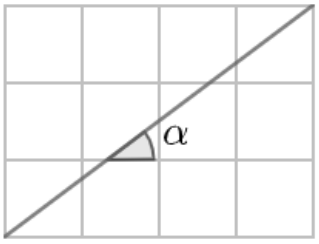
**2** $a=\sin 446^\circ\cdot \mathrm{tg}414^\circ$ va $b=\cos 289^\circ\cdot \mathrm{ctg}178^\circ$ sonlarini NOL bilan taqqoslang.
A)$a>0;b>0$ B)$a>0;b<0$
C)$a<0;b>0$ D)$a<0;b<0$

**3** Hisoblang: $4\sin 30^\circ+\mathrm{tg}\frac{\pi}{4}$
A)2 B)$1,5$ C)3 D)$2,5$

**4** Gipotenuzasining uzunligi 15 ga teng bo'lgan to'g'ri burchakli uchburchakning o'tkir burchagi tangensi $\frac{3}{4}$ ga teng. Bu uchburchak perimetrini toping.
A)40 B)35 C)32 D)36

**5** $\sin\alpha>0$ va $\mathrm{tg}\alpha<0$ bo'lsa, $\alpha$ burchak qaysi chorakda joylashgan?
A)$I$ B)$II$ C)$III$ D)$IV$

**6** Rasmda birlik kvadratchalar tasvirlangan. $\alpha$ burchakning sinusini toping.




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

**7** Ifodani soddalashtiring:
$\left[\frac{\sin(90^\circ-x)}{\cos(270^\circ+x)}+\frac{\sin x}{\sin(90^\circ+x)}\right]^{-1}\cdot\frac{1}{\cos(90^\circ+x)}$
A)$\cos x$ B)$-\cos x$ C)$\sin x$ D)$-\sin x$

**8** Agar $\text{tg}\alpha = -3$ bo'lsa, $\dfrac{3\sin\alpha - 4\cos^3\alpha}{5\sin^2\alpha\cos\alpha - 2\cos^2\alpha\sin\alpha}$ ning qiymatini toping.

A) $\dfrac{82}{5}$ B) $\dfrac{80}{39}$ C) $-\dfrac{94}{51}$ D) $-\dfrac{80}{39}$

**9** Agar $\dfrac{4\cos\alpha - 3\sin\alpha}{3\cos\alpha + 2\sin\alpha} = 3$ bo'lsa, $\text{tg}\alpha + \text{ctg}\alpha$ ning qiymatini toping.

A) $\dfrac{106}{45}$ B) $\dfrac{56}{45}$ C) $-\dfrac{56}{49}$ D) $-\dfrac{106}{45}$

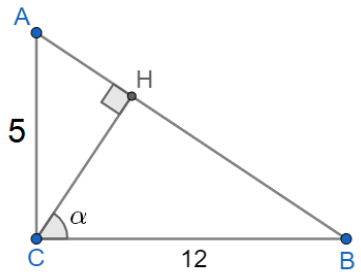
**10** Hisoblang: $\dfrac{\sin 142^\circ}{\cos 128^\circ} + \dfrac{\text{tg}46^\circ}{\text{ctg}224^\circ}$

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

**11** Hisoblang: $\dfrac{18\sin 18^\circ - 13\cos 288^\circ}{14\cos 108^\circ + 8\sin 198^\circ}$

A) $-\dfrac{5}{22}$ B) $-\dfrac{5}{6}$ C) $\dfrac{5}{6}$ D) $\dfrac{31}{22}$

**12** ABC to'g'ri burchakli uchburchak. AB gipotenuzaga CH balandlik tushurilgan. AC=5 va CB=12 bo'lsas, HCB burchak kosinusini toping.




A) $\dfrac{5}{13}$ B) $\dfrac{12}{13}$ C) $\dfrac{5}{12}$ D) $\dfrac{12}{5}$

**13** Agar $0 < \alpha < \dfrac{\pi}{2}$ va $\text{tg}\alpha = \dfrac{5}{12}$ bo'lsa, $\dfrac{\sin(450^\circ + \alpha) + \cos(990^\circ - \alpha)}{\cos(270^\circ + \alpha)} + \text{tg}(90^\circ + \alpha)$ ni hisoblang.

A) $\dfrac{14}{5}$ B) $\dfrac{25}{3}$ C) $\dfrac{29}{5}$ D) $-1$

**14** Agar $x + y = -90^\circ$ bo'lsa, $\dfrac{\text{tg}(2x+3y) + \text{ctg}(3x+2y)}{\text{tg}(4x+5y)}$ ni hisoblang.

A) 2 B) $-2$ C) 0 D) $2\text{tg}^2 y$

**15** Ifodaning eng katta qiymatini toping. $\dfrac{5-4\cos 2\alpha}{5+2\cos 2\beta}$

A)3 B)1 C)$\frac{1}{3}$ D)$\frac{9}{7}$

**16** Birlik aylanadagi $P\left(\frac{\sqrt{3}}{2};\frac{1}{2}\right)$ nuqtani $\alpha$ burchakka burilganda $P_1\left(-\frac{1}{2};-\frac{\sqrt{3}}{2}\right)$ nuqtaga o'tdi. $\alpha$ burchakni toping.

A)150° B)180° C)210° D)240°

**17** $x$ ning qanday qiymatlarida $(16-x^2)\sin 1\cdot\cos 2\cdot \text{tg}3,1$ ifodaning qiymati nomanfiy bo'ladi?

A)$(-\infty;4]\cup[4;\infty)$ B)$[-4;4]$

C)$x\le 4$ D)$[4;\infty)$

**18** $\alpha\in\left(\frac{\pi}{2};\pi\right), \sin\alpha=\frac{3}{5}$ bo'lsa, $\text{tg}\alpha-\cos\alpha$ ning qiymatini aniqlang.

A)$\frac{3}{4}$ B)$\frac{1}{20}$ C)$-\frac{1}{20}$ D)$\frac{15}{16}$

**19** $(2-\sin\alpha)(2+\sin\alpha)+(2+\cos\alpha)(2-\cos\alpha)$ ifodani soddalashtiring.

A)7 B)8 C)9 D)3

**20** $\text{tg}690°$ ning qiymatini toping.

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

**21** Katetlari 3 va 5 ga teng bo'lgan to'g'ri burchakli uchburchakning o'tkir burchaklari tangenslari yig'indisini toping.

A)$\frac{12}{5}$ B)$\frac{34}{15}$ C)$\frac{13}{15}$ D)$\frac{15}{4}$

**22** Qaysi chorakdagi $\alpha$ burchak uchun $|sin\alpha|=\sin\alpha$ va $|\cos\alpha|=-\cos\alpha$ tengliklar o'rinli bo'ladi?

A)$I$ B)$II$ C)$III$ D)$IV$

**23** Quyidagi ifodalardan qaysi biri ma'noga ega?
A)$\sqrt{\sin 1 \cdot \cos 2}$ B)$\log_{\text{tg}45^\circ} \cos 30^\circ$
C)$\dfrac{1}{\sin 90^\circ}$ D)$\sin^{-3} \pi$

**24** $\alpha \in \left(\dfrac{\pi}{2}; \pi\right)$ uchun $\sin\alpha = \dfrac{2}{3}$ bo'lsa, $\text{tg}\alpha$ ning qiymatini toping.
A)$\dfrac{2}{5}$ B)$\dfrac{\sqrt{5}}{2}$ C)$-\dfrac{\sqrt{5}}{2}$ D)$-\dfrac{2}{\sqrt{5}}$

**25** Quyidagi burchaklardan qaysi birida $\text{tg}\alpha$ ma'noga ega emas?
A)$\dfrac{\pi}{3}$ B)$\dfrac{5\pi}{2}$ C)$\dfrac{7\pi}{4}$ D)$2\pi$

**26** $\dfrac{3+2\cos\alpha}{2-\sin\beta}$ ifodaning eng katta va eng kichik qiymati yig'indisini toping.
A)$6\dfrac{1}{3}$ B)$3\dfrac{2}{3}$ C)$5\dfrac{1}{3}$ D)$5$

**27** Soddalashtiring: $\dfrac{\cos^2\alpha}{1+\sin\alpha} + \dfrac{\cos^2\alpha}{1-\sin\alpha}$
A)$-1$ B)$0$ C)$1$ D)$2$

**28** Soddalashtiring: $\dfrac{\text{tg}(-\alpha)+1}{1+\text{ctg}(-\alpha)}$
A)$\text{tg}\alpha$ B)$\text{ctg}\alpha$ C)$-\text{tg}\alpha$ D)$-\text{ctg}\alpha$

**29** $\text{ctg}\alpha = 4$ va $0 < \alpha < \pi$ bo'lsa, $\cos\alpha$ ning qiymatini toping.
A)$\dfrac{4}{\sqrt{17}}$ B)$\dfrac{1}{\sqrt{5}}$ C)$-\dfrac{1}{\sqrt{17}}$ D)$-\dfrac{4}{\sqrt{17}}$

**30** Soddalashtiring: $\sin\left(\dfrac{5\pi}{2}+\alpha\right)$
A)$\sin\alpha$ B)$-\cos\alpha$ C)$\cos\alpha$ D)$-\sin\alpha$

# 23. Aniq integral va egri chiziqli trapetsiya yuzi

**1-72. Aniq integralni hisoblang.**

**1** $\int_{-2}^{2} 5dx$

**2** $\int_{-1}^{2} edx$

**3** $\int_{1}^{3} \pi dx$

**4** $\int_{-2}^{3} 2xdx$

**5** $\int_{-1}^{1} 4xdx$

**6** $\int_{0}^{2} (-2x)dx$

**7** $\int_{1}^{4} (2x+1)dx$

**8** $\int_{2}^{3} (1-2x)dx$

**9** $\int_{-2}^{4} (2-4x)dx$

**10** $\int_{-3}^{0} (6x^2+2x-2)dx$

**11** $\int_{-2}^{2} (4x^3-2x-1)dx$

**12** $\int_{0}^{2} (x^3+3x^2-x+1)dx$

**13** $\int_{1}^{3} \frac{x^2+x}{x}dx$

**14** $\int_0^1 \frac{x^2+4x+3}{x+1}dx$

**15** $\int_3^5 \frac{x^2-3x+2}{x-2}dx$

**16** $\int_{-2}^3 \frac{2x^2-5x+3}{x-1}dx$

**17** $\int_0^2 4(x-1)^3 dx$

**18** $\int_{-2}^{-1} 6(x+2)^5 dx$

**19** $\int_1^2 3(3x-2)^{-4}dx$

**20** $\int_{0,75}^1 8(4x-5)^{-3}dx$

**21** $\int_1^8 x^{\frac{1}{3}}dx$

**22** $\int_0^1 x^{\frac{3}{4}}dx$

**23** $\int_4^9 \frac{1}{2\sqrt{x}}dx$

**24** $\int_1^8 \frac{1}{\sqrt[3]{x}}dx$

**25** $\int_{-1,5}^{2,5} 10(2x+3)^{\frac{2}{3}}dx$

**26** $\int_0^1 15(5x+4)^{\frac{1}{2}}dx$

**27** $\int_0^{16} \sqrt[4]{x}dx$

**28** $\int_0^1 x\sqrt[6]{x}dx$

**29** $\int_5^{10} \sqrt{x-1}dx$

**30** $\int_0^7 \sqrt[3]{x+1}dx$

**31** $\int_0^3 e^{2x}dx$

**32** $\int_{-1}^2 e^{3x+1}dx$

**33** $\int_0^1 e^{-4x-2}dx$

**34** $\int_1^4 e^{-3x+2}dx$

**35** $\int_0^2 2^{3x}dx$

**36** $\int_{-1}^0 5^{-3x-1}dx$

**37** $\int_0^1 3^{-2x+2}dx$

**38** $\int_2^4 7^{-0,5x+3}dx$

**39** $\int_{-2}^1 \frac{1}{x+3}dx$

**40** $\int_1^3 \frac{1}{2x+3}dx$

**41** $\int_{-3}^0 \frac{1}{2x-1}dx$

**42** $\int_3^5 \frac{1}{-2x+3}dx$

**43** $\int_2^3 \frac{x+2}{x+1}dx$

**44** $\int_{-1}^{1} \frac{2x+5}{x+2}dx$

**45** $\int_{1}^{3} \frac{2x+3}{x+2}dx$

**46** $\int_{0}^{2} \frac{3-2x}{x+1}dx$

**47** $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} 3sinxdx$

**48** $\int_{0}^{\frac{\pi}{3}} 4sin2xdx$

**49** $\int_{0}^{\pi} 2sin(0,25x)dx$

**50** $\int_{-\pi}^{\pi} -2cosxdx$

**51** $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} 3cos(3x)dx$

**52** $\int_{0}^{2\pi} 6cos(\frac{x}{3})dx$

**53** $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \frac{2}{\sin^2 x}dx$

**54** $\int_{\frac{\pi}{12}}^{\frac{\pi}{6}} \frac{3}{\cos^2 2x} dx$

**55** $\int_{-\frac{\pi}{2}}^{-\frac{\pi}{3}} \frac{4}{\sin^2(\frac{x}{2})} dx$

**56** $\int_0^{\pi} \frac{3}{\cos^2(\frac{x}{3})} dx$

**57** $\int_0^1 2(\sin^2 x + \cos^2 x) dx$

**58** $\int_0^{\sqrt{3}} \frac{1}{1+x^2} dx$

**59** $\int_{-1}^1 \frac{1}{1+x^2} dx$

**60** $\int_0^{0,5} \frac{1}{\sqrt{1-x^2}} dx$

**61** $\int_{-1}^1 \frac{1}{\sqrt{1-x^2}} dx$

**62** $\int_{-0,5}^{\frac{\sqrt{3}}{2}} \frac{1}{\sqrt{1-x^2}} dx$

**63** $\int_0^4 |x|\, dx$

**64** $\int_{-2}^{3} |x|\,dx$

**65** $\int_{0}^{4} |x-2|\,dx$

**66** $\int_{-1}^{3} (|x|+|x-2|)dx$

**67** $\int_{0}^{5} (|x-1|+|x-4|)dx$

**68** $\int_{0}^{4} (|x-1|+|x-2|)dx$

**69** $\int_{0}^{\pi} |cosx|\,dx$

**70** $\int_{0}^{2\pi} |sinx|\,dx$

**71** $\int_{0}^{\pi} |cos2x|\,dx$

**72** $\int_{0}^{\frac{\pi}{3}} |sin3x|\,dx$

**73-94. Quyidagi shakllar bilan chegaralangan soha yuzini toping.**

**73** $y=2x, \quad y=0, \quad x=0, \quad x=2$

**74** $y = 6 - 3x, \quad y = 0, \quad x = 0, \quad x = 2$

**75** $y = 4x - 6, \quad y = 0, \quad x = 2, \quad x = 4$

**76** $y = x^2 - 2x + 2, \quad y = 0, \quad x = 1, \quad x = 2$

**77** $y = x^2 + 2x, \quad y = 0, \quad x = 0, \quad x = 2$

**78** $y = 2\sqrt{x}, \quad y = 0 \quad x = 0, \quad x = 1$

**79** $y = \frac{1}{x}, \quad y = 0, \quad x = \frac{1}{2}, \quad x = 2$

**80** $y = \sqrt{x-1}, \quad y = 0 \quad x = 1, \quad x = 2$

**81** $y = \frac{2x-1}{x}, \quad y = 0, \quad x = 1, \quad x = 3$

**82** $y = -\frac{1}{x}, \quad y = 0, \quad x = 2, \quad x = 4$

**83** $y = \cos x, \quad y = 0, \quad x = -\frac{\pi}{2}, \quad x = \frac{\pi}{2}$

**84** $y = \sin x, \quad y = 0, \quad x = 0, \quad x = \pi$

**85** $y = e^x, \quad x = 0, \quad y = 0, \quad x = \ln 5$

**86** $y = x^2, \qquad y = 1$

**87** $y = 2x - x^2, \qquad y = x$

**88** $y = \dfrac{x^2}{2}, \qquad y = 2 - \dfrac{3}{2}x$

**89** $y = 2^x \qquad y = 2x$

**90** $y = \sin x, \quad x = -\dfrac{\pi}{2}, \quad x = \dfrac{\pi}{2}, \quad y = 0$

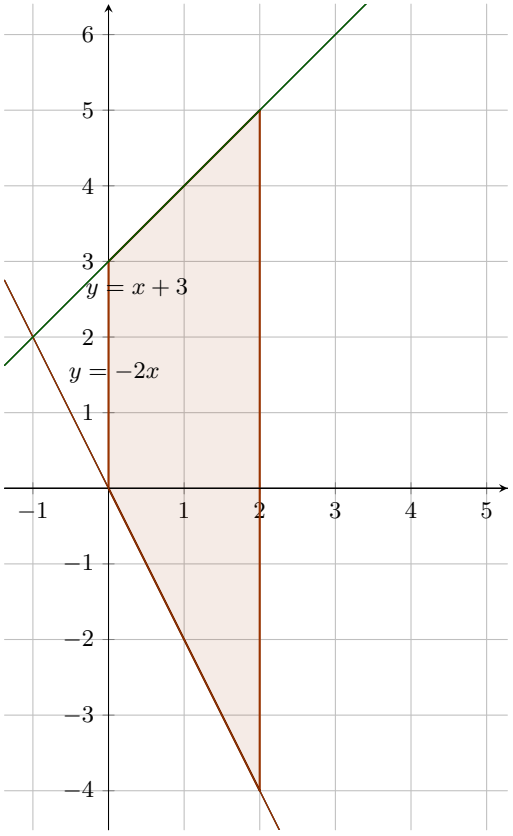
**91** $y = \cos x, \quad x = 0, \quad x = \pi, \quad y = 0$

**92** $y = x^3, \quad y = 0, \quad x = -1, \quad x = 1$

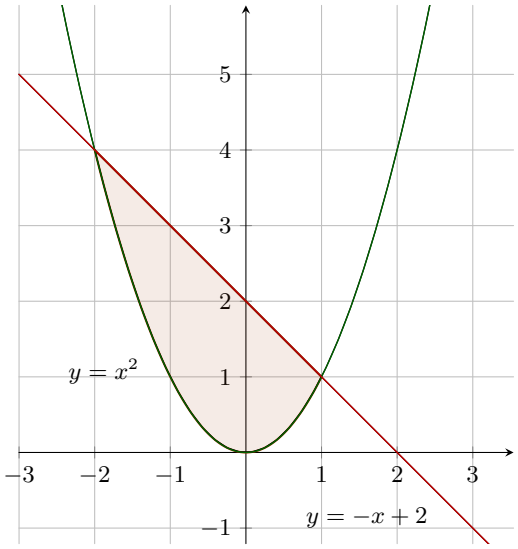
**93** $y = x^2 - 2x, \quad x = -1, \quad x = 1, \quad y = 0$

**94** $y = e^x - 1, \quad y = 0, \quad x = -1, \quad x = 1$

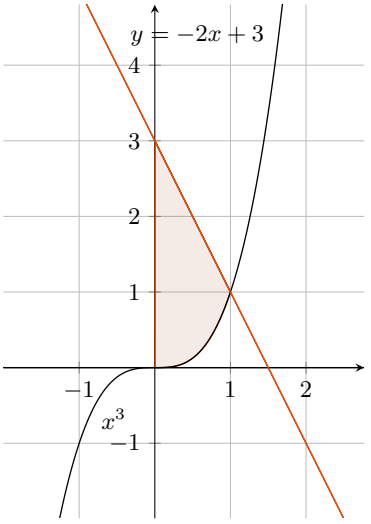
**95** Bo‘yalgan soha yuzini toping:



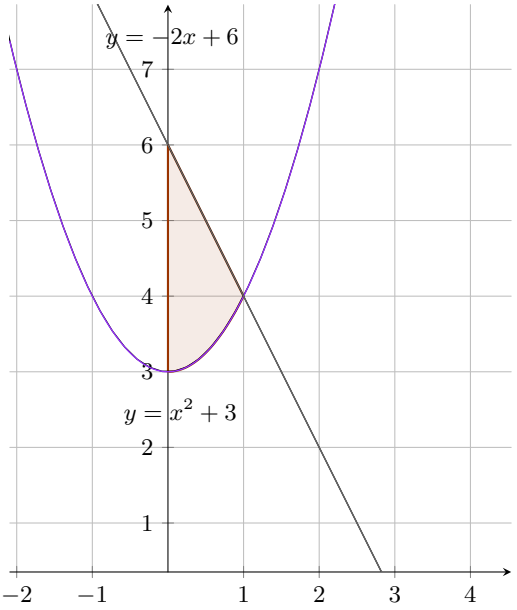

**96** Bo‘yalgan soha yuzini toping:



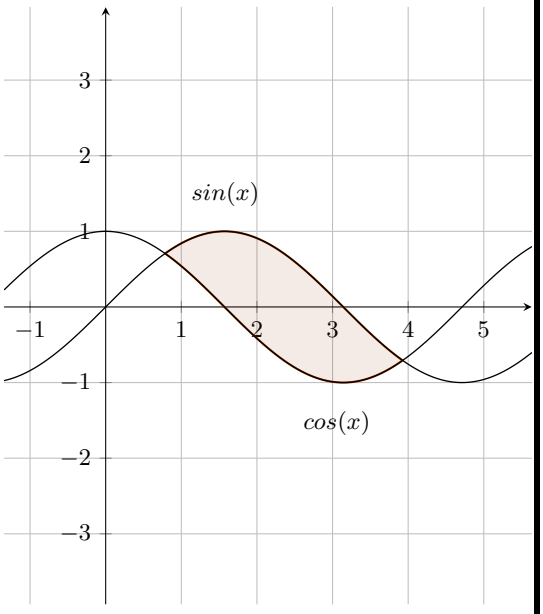

**97** Bo‘yalgan soha yuzini toping:



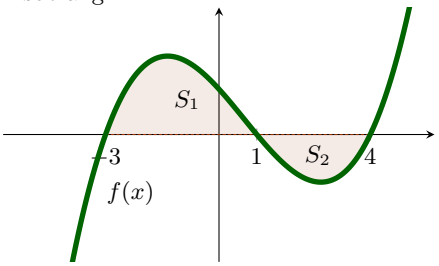
**98** Bo‘yalgan soha yuzini toping:



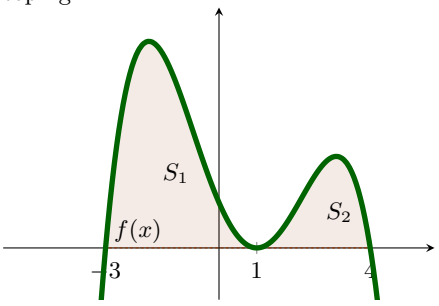

**99** Bo‘yalgan soha yuzini toping:



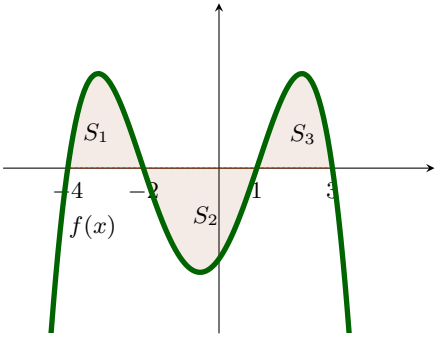

**100** Agar $S_1 = 5, S_2 = 3$ bo‘lsa $\int_{-3}^{4} f(x)dx$ ni hisoblang.



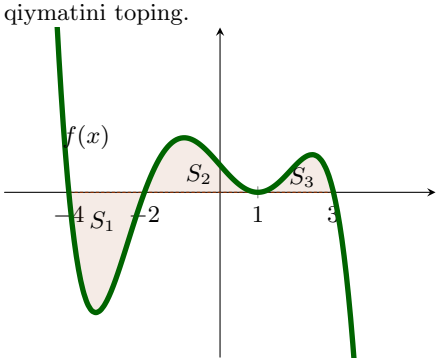

**101** Agar $S_1 = 6$ va $\int_{-3}^{2} f(x)dx = 9$ bo‘lsa $S_2$ ni toping.



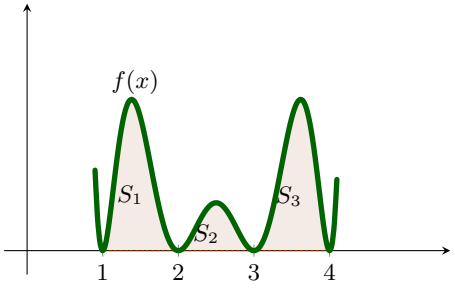

**102** Agar $S_1 = 2$, $S_2 = 3$ va $\int_{-4}^{3} f(x)dx = 7$ bo‘lsa $S_3$ ni toping.



**103** Agar $S_1 = S_2$ bo‘lsa $\int_{-4}^{3} f(x)dx - S_3$ ning qiymatini toping.




**104** Agar $S_1 + S_2 = 2.5$, $2S_1 + S_2 = 4$ bo‘lsa, $\int_2^3 f(x)dx$ ni toping.




**105** $\int_a^b 2\mathrm{dx} = 8$ va $a + b = 4$ bo‘lsa, $a$ ning qiymatini toping.

**106** $\int_b^a \mathrm{dx} = 4$ va $a^2 - b^2 = 8$ bo‘lsa, $a + 2b$ ning qiymatini toping.

**107** Agar $\int_{-1}^{2} f(x)dx = 4$ bo‘lsa, $\int_{-1}^{2} (2 + f(x))dx$ ning qiymatini toping.

**108** Agar $\int_{-2}^{3} 2f(x)dx = 6$ bo‘lsa, $\int_{-2}^{3} (3 + f(x))dx$ ning qiymatini toping.

**109** Agar $\int_0^3 f(x)\,dx = 3$ va $\int_0^3 g(x)\,dx = 2$ bo‘lsa, $\int_0^3 (f(x) + g(x))dx$ ni hisoblang.

**110** Agar $\int_{-2}^{2} f(x)\,dx = 2$ va $\int_{-2}^{2} g(x)\,dx = 4$ bo‘lsa, $\int_{-2}^{2} (f(x) + 3g(x))dx$ ni hisoblang.

**111** Agar $\int_{-3}^{3} f(x)\,dx = 6$ bo‘lsa, $\int_{-3}^{3} (f(x) + x)dx$ ni hisoblang.

**112** Agar $\int_0^3 f(x)\,dx = 4$ bo‘lsa, $\int_0^3 (f(x) + 2x)dx$ ni hisoblang.

**113** Agar $\int_{-3}^{2} f(x)\,dx = 3$ bo‘lsa, $\int_{-3}^{2} (f(x) + 4x)dx$ ni hisoblang.

**114** Agar $f(x)$ toq funksiya bo'lib, $\int_{-2}^{3} f(x)dx = 5$ bo'lsa, $\int_{2}^{3} f(x)dx$ ni hisoblang.

**115** Agar $\int_{1}^{2} \frac{2x-1}{x+1}dx = a - b\ln\frac{3}{2}$ bo'lsa $a+b$ ning qiymatini toping.

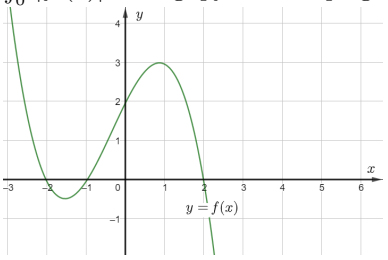
**116** Agar $\int_{2}^{3} \frac{4x+2}{x+3}dx = a - 10\ln c$ bo'lsa, $a+c$ ning qiymatini toping.

**117** $f(x) = \frac{1+ax}{bx}$ bo'lib, $f'\left(\frac{1}{2}\right) = -2$ va $\int_{1}^{3} f(x)dx = \frac{\ln 3 + 6}{2}$ bo'lsa $a+b$ ning qiymatini toping.

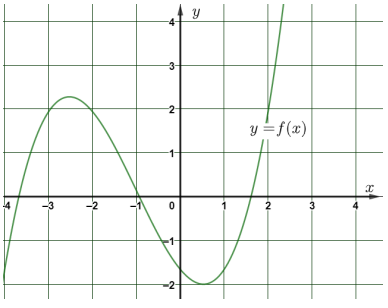
**118** $f(x) = a\sin x + b$ funksiya uchun $\int_{0}^{\pi} f(x)dx = 0$ va $f'(0) = \frac{1}{\pi}$ bo'lsa, $a-b$ ning qiymatini toping.

**119** $f(x) = a\cos\frac{\pi x}{2} + b$ funksiya uchun $\int_{0}^{2} f(x)dx = 5$ va $f'(3) = 7$ bo'lsa, $a+b$ ning qiymatini toping.

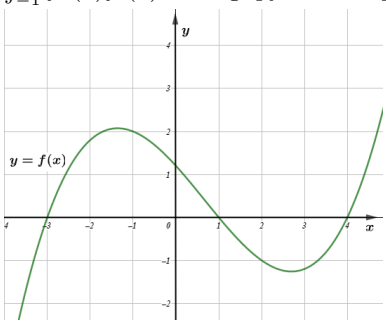
**120** Chizmada $y = f(x)$ funksiya grafigi berilgan. $\int_{0}^{2} |f'(x)|dx$ ning qiymatini toping.



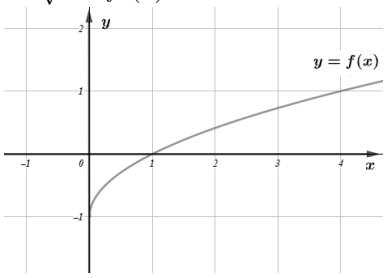

**121** Chizmada $y = f(x)$ funksiya grafigi berilgan. $\int_{-1}^{2} |f'(x)|dx$ ning qiymatini toping.



**122** Chizmada $y = f(x)$ funksiya grafigi berilgan. $\int_{-1}^{4} f^2(x)f'(x)dx$ ning qiymatini toping.




**123** Chizmada $y = f(x)$ funksiya grafigi berilgan. $\int_{0}^{4} \frac{f'(x)}{\sqrt{1-f^2(x)}}dx$ ning qiymatini toping.




**124** $f(x) = \begin{cases} x^2, & x < 0 \\ 2x-3, & x \geq 0 \end{cases}$ bo'lsa, $\int_{-1}^{3} xf(x)dx$ ni hisobang.

**125** $f(x) = \begin{cases} 4x^2, & x < 0 \\ x-3, & x \geq 0 \end{cases}$ bo'lsa, $\int_{-2}^{2} xf(x)dx$ ni hisobang.

# JAVOBLAR

| | |
|---|---|
| **1.** | 20 |
| **2.** | $3e$ |
| **3.** | $2\pi$ |
| **4.** | 5 |
| **5.** | 0 |
| **6.** | $-4$ |
| **7.** | 18 |
| **8.** | $-4$ |
| **9.** | $-12$ |
| **10.** | 39 |
| **11.** | $-4$ |
| **12.** | 12 |
| **13.** | 6 |
| **14.** | 3,5 |
| **15.** | 6 |
| **16.** | $-10$ |
| **17.** | 0 |
| **18.** | 1 |
| **19.** | $\frac{21}{64}$ |
| **20.** | $-\frac{3}{4}$ |
| **21.** | $11\frac{1}{4}$ |
| **22.** | $\frac{4}{7}$ |
| **23.** | 1 |
| **24.** | 4, 5 |
| **25.** | 96 |
| **26.** | 38 |
| **27.** | $\frac{128}{5}$ |
| **28.** | $\frac{6}{13}$ |
| **29.** | $\frac{38}{3}$ |
| **30.** | $\frac{45}{4}$ |
| **31.** | $\frac{e^6-1}{2}$ |
| **32.** | $\frac{e^9-1}{3e^2}$ |
| **33.** | $\frac{e^4-1}{4e^6}$ |
| **34.** | $\frac{e^9-1}{3e^{10}}$ |
| **35.** | $\frac{21}{\ln 2}$ |
| **36.** | $\frac{124}{15\ln 5}$ |
| **37.** | $\frac{4}{\ln 3}$ |
| **38.** | $\frac{84}{\ln 7}$ |
| **39.** | $2\ln 2$ |
| **40.** | $\frac{1}{2}\ln\frac{9}{5}$ |
| **41.** | $-\frac{1}{2}\ln 7$ |
| **42.** | $\frac{1}{2}\ln\frac{3}{7}$ |
| **43.** | $1+\ln\frac{4}{3}$ |
| **44.** | $4+\ln 3$ |
| **45.** | $4+\ln\frac{3}{5}$ |

**46.** $5\ln 3 - 4$
**47.** $\frac{3\sqrt{3}}{2}$
**48.** $3$
**49.** $-4\sqrt{2} + 8$
**50.** $0$
**51.** $-1$
**52.** $9\sqrt{3}$
**53.** $-2 + 2\sqrt{3}$
**54.** $\sqrt{3}$
**55.** $8\sqrt{3} - 8$
**56.** $9\sqrt{3}$
**57.** $2$
**58.** $\frac{\pi}{3}$
**59.** $\frac{\pi}{2}$
**60.** $\frac{\pi}{6}$
**61.** $\pi$
**62.** $\frac{\pi}{2}$
**63.** $8$
**64.** $6,5$
**65.** $4$
**66.** $10$
**67.** $17$
**68.** $9$
**69.** $2$
**70.** $4$
**71.** $2$
**72.** $\frac{2}{3}$
**73.** $4$
**74.** $6$
**75.** $12$
**76.** $\frac{4}{3}$
**77.** $\frac{20}{3}$
**78.** $\frac{4}{3}$
**79.** $2\ln 2$
**80.** $\frac{2}{3}$
**81.** $4 - \ln 3$
**82.** $\ln 2$
**83.** $2$
**84.** $2$
**85.** $4$
**86.** $\frac{4}{3}$
**87.** $\frac{1}{6}$
**88.** $\frac{125}{12}$
**89.** $3 - 2\log_2 e$
**90.** $2$
**91.** $2$
**92.** $\frac{1}{2}$
**93.** $2$
**94.** $\frac{e^2 - 2e - 1}{e}$
**95.** $12$
**96.** $4,5$
**97.** $\frac{7}{4}$
**98.** $\frac{5}{3}$
**99.** $2\sqrt{2}$
**100.** $2$
**101.** $3$
**102.** $8$
**103.** $0$
**104.** $1$
**105.** $0$
**106.** $1$
**107.** $10$
**108.** $18$
**109.** $5$
**110.** $14$
**111.** $6$
**112.** $13$
**113.** $-7$
**114.** $5$
**115.** $5$
**116.** $5,2$
**117.** $5$
**118.** $\frac{\pi + 2}{\pi^2}$
**119.** $\frac{28 + 5\pi}{2\pi}$
**120.** $4$
**121.** $6$
**122.** $-\frac{8}{3}$
**123.** $\pi$
**124.** $\frac{17}{4}$
**125.** $-\frac{58}{3}$

**Mavzuga doir murakkab masalalar yechilish usullari bilan tanishish uchun QR code ni skanerlang yoki suratga olib, *@idcuzbot* ga yuboring.**

# Qaydlar uchun