

TRİGONOMETRİ

$$1. -\frac{23\pi}{6} = -\frac{24\pi}{6} + \frac{\pi}{6} \text{ yazılır.}$$

$$= -4\pi + \frac{\pi}{6} \text{ olur}$$

$$\text{Esas ölçü} = \frac{\pi}{6} = 30^\circ \text{ dir.}$$

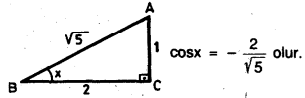
CEVAP A

2. $0 \leq x \leq 90^\circ$ olmak üzere,
1) x büyürse, $\sin x$ ve $\tan x$ de büyür.
2) $0 \leq \sin x \leq 1$ ve $0 \leq \tan x < \infty$
 $45 < x < 90 \Rightarrow 1 < \tan x < \infty$ olur.
 $c = \cos 18^\circ = \sin 72^\circ$ dir.
 $a = \sin 68^\circ$ idi. Öyle ise,
 $\sin 68^\circ < \sin 72^\circ < 1$ ve $a < c < 1$ dir.
 $\tan 50^\circ > 1$ ve $b > 1$ dir.

Buna göre,
 $a < c < b$ yazılır.

CEVAP B

3. $\pi < x < \frac{3\pi}{2}$ ve $\tan x = 0,5 = \frac{1}{2}$ ise,



$$\cos 2x = 2 \cdot \cos^2 x - 1 \text{ idi.}$$

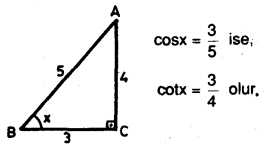
$$= 2 \cdot \left(-\frac{2}{\sqrt{5}}\right)^2 - 1$$

$$= \frac{8}{5} - 1$$

$$= \frac{3}{5} \text{ bulunur.}$$

CEVAP C

4. $\frac{\sin(270^\circ + x)}{\tan(180^\circ - x)} \cdot \sec x = A$ olsun.
 $A = \frac{-\cos x}{-\tan x} \cdot \frac{1}{\cos x} = \frac{1}{\tan x} = \cot x$ olur.



$$A = \cot x = \frac{3}{4} \text{ bulunur.}$$

CEVAP C

Temel Çalışma Soruları - 02 - çözümler

$$5. \operatorname{cosec} x - \frac{\sin x}{1 + \cos x} = \frac{1}{\sin x} - \frac{\sin x}{1 + \cos x}$$

$$= \frac{1 + \cos x - \sin^2 x}{\sin x (1 + \cos x)}$$

$$= \frac{1 + \cos x - (1 - \cos^2 x)}{\sin x (1 + \cos x)}$$

$$= \frac{1 + \cos x - 1 + \cos^2 x}{\sin x (1 + \cos x)}$$

$$= \frac{\cos x (1 + \cos x)}{\sin x (1 + \cos x)}$$

$$= \cot x \text{ bulunur.}$$

CEVAP E

$$6. 3 \cdot \sin\left(x - \frac{\pi}{2}\right) + 2k = 4$$

$$-3 \cdot \cos x + 2k = 4$$

$$2k = 4 + 3 \cdot \cos x$$

ifadesinde k nın en büyük değeri alabilmesi için, $\cos x$ en büyük değeri almaktadır. $\cos x$ in en büyük değeri 1 dir.

Buna göre,
 $2k = 4 + 3 \cdot 1$

$$k = \frac{7}{2} \text{ olmalıdır.}$$

CEVAP C

$$7. \left(\frac{1 + \cos x}{\sin x} + \frac{\sin x}{1 + \cos x}\right) \cdot \left(\frac{1 - \cos^2 x}{2}\right) = ?$$

$$= \left(\frac{1 + 2 \cos x + \cos^2 x + \sin^2 x}{\sin x (1 + \cos x)}\right) \cdot \frac{\sin^2 x}{2}$$

$$= \frac{2(1 + \cos x) \cdot \sin^2 x}{\sin x (1 + \cos x) \cdot 2}$$

$$= \sin x \text{ bulunur.}$$

CEVAP B

$$8. \frac{\sin 40^\circ}{1 + \cos 40^\circ} \cdot \frac{\cos 20^\circ}{1 + \cos 20^\circ} = ?$$

$$= \frac{2 \cdot \sin 20^\circ \cos 20^\circ}{1 + 2 \cos^2 20^\circ - 1} \cdot \frac{\cos 20^\circ}{1 + 2 \cos^2 20^\circ - 1}$$

$$= \frac{\sin 20^\circ}{2 \cdot \cos^2 20^\circ}$$

$$= \frac{2 \cdot \sin 10^\circ \cos 10^\circ}{2 \cdot \cos^2 10^\circ} = \frac{\sin 10^\circ}{\cos 10^\circ}$$

$$= \tan 10^\circ \text{ bulunur.}$$

CEVAP C

TRİGONOMETRİ

$$9. 3 \tan x \cdot \sin 2x + 3 \cdot \cos 2x = ?$$

$$= 3 \cdot \left(\frac{\sin x}{\cos x} \cdot \sin 2x + \cos 2x\right)$$

$$= 3 \cdot \left(\frac{\sin 2x \cdot \sin x + \cos 2x \cdot \cos x}{\cos x}\right)$$

$$= 3 \cdot \frac{\cos(2x - x)}{\cos x} = \frac{3 \cdot \cos x}{\cos x}$$

$$= 3 \text{ bulunur.}$$

CEVAP A

10. $3 \cdot \sin 2x - 2 \cdot \cos 3y$ ifadesinin en büyük değeri alabilmesi için $\sin 2x$ in en büyük ve $\cos 3y$ nin en küçük değeri olması gerekir.

Buna göre,
 $\sin 2x = 1$ ve $\cos 3y = -1$ olmalıdır.

$$\sin 2x = 1 \Rightarrow x = \frac{\pi}{2}$$

$$\cos 3y = -1 \Rightarrow y = \frac{\pi}{3} \text{ olur.}$$

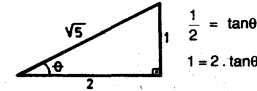
$$x + y = \frac{\pi}{2} + \frac{\pi}{3}$$

$$(3) \quad (4)$$

$$= \frac{7\pi}{6} \text{ bulunur.}$$

CEVAP D

11.



$$A = 2 \cos x + \sin x$$

$$A = 2 \cdot \cos x + 2 \cdot \tan \theta \cdot \sin x$$

$$A = 2 \cdot \left(\cos x + \frac{\sin \theta}{\cos \theta} \cdot \sin x\right)$$

$$A = 2 \cdot \frac{\cos x \cdot \cos \theta + \sin x \cdot \sin \theta}{\cos \theta}$$

$$A = 2 \cdot \frac{\cos(x - \theta)}{2} = \sqrt{5} \cdot \cos(x - \theta)$$

$$\cos(x - \theta) = 1 \text{ için,}$$

$$A = \sqrt{5} \cdot \cos(x - \theta) \text{ en büyük değerini alır.}$$

$$\text{Max}(A) = \sqrt{5} \cdot 1 = \sqrt{5} \text{ bulunur.}$$

CEVAP D

UYARI :

$$A = a \cdot \cos x + b \cdot \sin x \text{ ise,}$$

$$1) \max(A) = \sqrt{a^2 + b^2}$$

$$2) \min(A) = -\sqrt{a^2 + b^2}$$

Temel Çalışma Soruları - 02 - çözümler

12. $8 \cdot \cos 4x \cdot \cos 2x \cdot \cos x \cdot \sin x = T$ olsun.
 $T = 2 \cdot \sin x \cos x \cdot 4 \cdot \cos 2x \cdot \cos 4x$
 $T = 4 \cdot \sin 2x \cdot \cos 2x \cdot \cos 4x$
 $T = 2 \cdot \sin 4x \cdot \cos 4x$
 $T = \sin 8x$ bulunur.

CEVAP C

13. $\frac{\sin 10^\circ + \cos 40^\circ + \sin 20^\circ}{2 \cdot \sin 65^\circ} = A$ olsun.

$$A = \frac{\sin 10^\circ + \sin 50^\circ + \sin 20^\circ}{2 \cdot \sin 65^\circ}$$

$$A = \frac{2 \cdot \sin 30^\circ \cdot \cos 20^\circ + \sin 20^\circ}{2 \cdot \sin 65^\circ}$$

$$A = \frac{\cos 20^\circ + \sin 20^\circ}{2 \cdot \sin 65^\circ}$$

$$A = \frac{\sin 70^\circ + \sin 20^\circ}{2 \cdot \sin 65^\circ}$$

$$A = \frac{2 \cdot \sin 45^\circ \cdot \cos 25^\circ}{2 \cdot \cos 25^\circ} = \sin 45^\circ$$

$$A = \frac{\sqrt{2}}{2} \text{ bulunur.}$$

CEVAP B

14. $\frac{\sin 18^\circ + \cos 18^\circ}{\sin 6^\circ + \cos 6^\circ} = T$ olsun.

$$T = \frac{\sin 18^\circ \cdot \cos 6^\circ + \cos 18^\circ \cdot \sin 6^\circ}{\sin 6^\circ \cdot \cos 6^\circ}$$

$$T = \frac{\sin(18^\circ + 6^\circ)}{\sin 6^\circ \cdot \cos 6^\circ} = \frac{2 \cdot \sin 24^\circ}{\sin 12^\circ}$$

$$T = \frac{2 \cdot 2 \cdot \sin 12^\circ \cdot \cos 12^\circ}{\sin 12^\circ}$$

$$T = 4 \cdot \cos 12^\circ \text{ ve}$$

$$T = 4 \cdot \sin 78^\circ \text{ olur}$$

$$T = 4k \text{ bulunur.}$$

CEVAP C

$$15. \frac{\sin 3x}{\sin x} + \frac{\cos 3x}{\cos x} = 2$$

$$\frac{\sin 3x \cdot \cos x + \cos 3x \cdot \sin x}{\sin x \cdot \cos x} = 2$$

$$\sin(3x + x) = 2 \cdot \sin x \cdot \cos x$$

$$\sin 4x = \sin 2x$$

$$2 \cdot \sin 2x \cdot \cos 2x = \sin 2x$$

$$\cos 2x = \frac{1}{2} \text{ bulunur.}$$

CEVAP B

$$16. A = 2 \cdot \cos 25^\circ \cdot \sin 13^\circ + \sin 38^\circ + \sin 12^\circ$$

$$A = 2 \cdot \cos 25^\circ \cdot \sin 13^\circ + 2 \cdot \sin 25^\circ \cdot \cos 13^\circ$$

$$A = 2 \sin(25^\circ + 13^\circ) = 2 \cdot \sin 38^\circ$$

$$A = 2 \cdot \cos 52^\circ$$

$$A = 2k \text{ bulunur.}$$

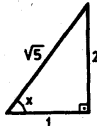
CEVAP B

$$17. \frac{\sin x + \sec x}{\cos x + \operatorname{cosec} x} = 2$$

$$\frac{\sin x + \frac{1}{\cos x}}{\cos x + \frac{1}{\sin x}} = 2$$

$$\frac{\sin x \cdot \cos x + 1}{\cos x} \cdot \frac{\sin x}{\sin x \cdot \cos x + 1} = 2$$

$$\frac{\sin x}{\cos x} = \tan x = 2$$



$$\cos x = \frac{1}{\sqrt{5}}$$

$$\cos 2x = 2 \cdot \cos^2 x - 1$$

$$= 2 \cdot \left(\frac{1}{\sqrt{5}}\right)^2 - 1$$

$$= \frac{2}{5} - 1$$

$$= -\frac{3}{5} \text{ bulunur.}$$

CEVAP D

$$18. \frac{1}{\sin 10^\circ} - \frac{\sqrt{3}}{\cos 10^\circ} = ?$$

$$= \frac{\cos 10^\circ - \sqrt{3} \cdot \sin 10^\circ}{\sin 10^\circ \cdot \cos 10^\circ}$$

$$= \frac{\cos 10^\circ - \tan 60^\circ \cdot \sin 10^\circ}{\sin 10^\circ \cdot \cos 10^\circ}$$

$$= \frac{\cos 10^\circ - \frac{\sin 60^\circ}{\cos 60^\circ} \cdot \sin 10^\circ}{\sin 10^\circ \cdot \cos 10^\circ}$$

$$= \frac{\cos 60^\circ \cdot \cos 10^\circ - \sin 60^\circ \cdot \sin 10^\circ}{\cos 60^\circ \cdot \sin 10^\circ \cdot \cos 10^\circ}$$

$$= \frac{\cos(60^\circ + 10^\circ)}{\frac{1}{2} \sin 10^\circ \cdot \cos 10^\circ}$$

$$= \frac{4 \cdot \cos 70^\circ}{\sin 20^\circ} = \frac{4 \cdot \sin 20^\circ}{\sin 20^\circ}$$

$$= 4 \text{ bulunur.}$$

CEVAP E

$$19. \frac{\sin 80^\circ + \sin 140^\circ \cdot \cos 40^\circ}{\cos 170^\circ} = ?$$

$$= \frac{\sin 80^\circ + \sin 40^\circ \cdot \cos 40^\circ}{-\cos 10^\circ}$$

$$= \frac{2 \cdot \sin 80^\circ + 2 \cdot \sin 40^\circ \cdot \cos 40^\circ}{-2 \sin 80^\circ}$$

$$= \frac{2 \cdot \sin 80^\circ + \sin 80^\circ}{-2 \sin 80^\circ} = \frac{3 \cdot \sin 80^\circ}{-2 \sin 80^\circ}$$

$$= -\frac{3}{2} \text{ bulunur.}$$

CEVAP C

$$20. \frac{\sin(60+x) \cdot \sin(60-x)}{1 + 2 \cdot \cos 2x} = ?$$

$$= \frac{-\frac{1}{2}(\cos 120^\circ - \cos 2x)}{1 + \cos 2x}$$

$$= \frac{-\frac{1}{2}(-\frac{1}{2} - \cos 2x)}{1 + 2 \cdot \cos 2x}$$

$$= \frac{\frac{1}{4} + \frac{1}{2} \cdot \cos 2x}{1 + 2 \cdot \cos 2x}$$

$$= \frac{1 + 2 \cos 2x}{4(1 + 2 \cos 2x)}$$

$$= \frac{1}{4} \text{ bulunur.}$$

CEVAP B

$$21. \frac{\cos B + \cos C}{\sin B + \sin C} = K \text{ olsun.}$$

$$K = \frac{2 \cdot \cos \frac{B+C}{2} \cdot \cos \frac{B-C}{2}}{2 \cdot \sin \frac{B+C}{2} \cdot \cos \frac{B-C}{2}}$$

$$K = \cot \frac{B+C}{2} \text{ dir.}$$

$$\widehat{s(A)} = 120^\circ \Rightarrow \widehat{s\left(\frac{B+C}{2}\right)} = 30^\circ \text{ olup}$$

$$K = \cot 30^\circ = \sqrt{3} \text{ bulunur.}$$

CEVAP A

$$22. \frac{\sin 5x - \sin 3x}{\cos 5x + \cos 3x} = \cot y$$

$$\frac{2 \cos 4x \cdot \sin x}{2 \cos 4x \cdot \cos x} = \cot y$$

$$\tan x = \cot y \Rightarrow$$

$$x + y = \frac{\pi}{2} \text{ bulunur.}$$

CEVAP C

$$23. \frac{\sin x + \sin 2x + \sin 3x}{\cos x + \cos 2x + 1} = A \text{ olsun.}$$

$$A = \frac{2 \cdot \sin 2x \cdot \cos x + \sin 2x}{\cos x + 2 \cdot \cos^2 x - 1 + 1}$$

$$A = \frac{\sin 2x (2 \cos x + 1)}{\cos x (1 + 2 \cos x)}$$

$$A = \frac{2 \cdot \sin x \cdot \cos x}{\cos x} = 2 \cdot \sin x \text{ olur.}$$

CEVAP A

$$24. \frac{\cos x - \cos y}{\sin x + \sin y} = M \text{ olsun.}$$

$$M = \frac{-2 \cdot \sin \frac{x+y}{2} \cdot \sin \frac{x-y}{2}}{2 \cdot \sin \frac{x+y}{2} \cdot \cos \frac{x-y}{2}}$$

$$M = -\tan \frac{x-y}{2}$$

$$x - y = \frac{2\pi}{3} \text{ ise } \frac{x-y}{2} = \frac{\pi}{3} \text{ olur.}$$

$$M = -\tan \frac{\pi}{3} = \sqrt{3} \text{ bulunur.}$$

CEVAP C

$$25. \sin 20^\circ \cdot \cos 50^\circ \cdot \sin 80^\circ = K \text{ olsun.}$$

$$K = -\frac{1}{2}(\cos 100^\circ - \cos 60^\circ) \cdot \cos 50^\circ$$

$$K = -\frac{1}{2} \cdot \cos 100^\circ \cdot \cos 50^\circ + \frac{1}{2} \cdot \frac{1}{2} \cdot \cos 50^\circ$$

$$K = -\frac{1}{4}(\cos 150^\circ + \cos 50^\circ) + \frac{1}{4} \cos 50^\circ$$

$$K = -\frac{1}{4} \cdot \cos 150^\circ$$

$$K = -\frac{1}{4} \cdot \left(-\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{8} \text{ bulunur.}$$

CEVAP C

$$26. \frac{\sin 6x + 2 \cdot \sin 4x + \sin 2x}{\sin 5x + 2 \cdot \sin 3x + \sin x} = T \text{ olsun.}$$

$$T = \frac{2 \cdot \sin 4x \cdot \cos 2x + 2 \sin 4x}{2 \cdot \sin 3x \cdot \cos 2x + 2 \cdot \sin 3x}$$

$$T = \frac{2 \cdot \sin 4x (\cos 2x + 1)}{2 \cdot \sin 3x (\cos 2x + 1)}$$

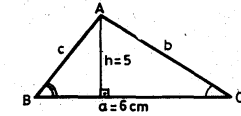
$$T = \frac{\sin 4x}{\sin 3x} \text{ dir.}$$

$$7x = \pi \text{ ise } \sin 4x = \sin 3x \text{ olur.}$$

$$T = \frac{\sin 4x}{\sin 4x} = 1 \text{ bulunur.}$$

CEVAP D

27.



$$A(ABC) = \frac{a \cdot h}{2} = 15 \Rightarrow h = 5 \text{ cm}$$

$$\sin B = \frac{5}{c}, \quad \sin C = \frac{5}{b}$$

$$A(ABC) = \frac{1}{2} \cdot b \cdot c \cdot \sin A = 15$$

$$\sin A = \frac{30}{b \cdot c}$$

$$\frac{\sin B \cdot \sin C}{\sin A} = \frac{\frac{5}{c} \cdot \frac{5}{b}}{\frac{30}{b \cdot c}}$$

$$= \frac{5}{6} \text{ bulunur.}$$

CEVAP C

28. Sinüs teoremine göre,

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{a}{\sin 80^\circ} = \frac{b}{\sin 40^\circ}$$

$$a = \frac{b \cdot \sin 80^\circ}{\sin 40^\circ}$$

$$a = \frac{b \cdot 2 \cdot \sin 40^\circ \cdot \cos 40^\circ}{\sin 40^\circ}$$

$$a = 2b \cdot \cos 40^\circ \text{ bulunur.}$$

CEVAP E

29. Kosinüs teoremine göre,

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac} \text{ yazılır.}$$

$$b \cdot \cos C - c \cdot \cos B = ?$$

$$= b \cdot \frac{a^2 + b^2 - c^2}{2ab} - c \cdot \frac{a^2 + c^2 - b^2}{2ac}$$

$$= \frac{b^2 - c^2}{a} \text{ olup}$$

$$= \frac{6^2 - 4^2}{5} = 4 \text{ bulunur.}$$

CEVAP D

30. Sinüs teoremine göre,

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R \text{ olup}$$

$$\left. \begin{aligned} a &= 2R \sin A \\ b &= 2R \sin B \\ c &= 2R \sin C \end{aligned} \right\} \text{ yazılır.}$$

$$\frac{b+c}{a+b+c} = \frac{2R \cdot \sin B + 2R \cdot \sin C}{2R \cdot \sin A + 2R \cdot \sin B + 2R \cdot \sin C}$$

$$= \frac{\sin B + \sin C}{\sin A + \sin B + \sin C}$$

$$= \frac{3 \sin A}{\sin A + 3 \cdot \sin A}$$

$$= \frac{3 \cdot \sin A}{4 \cdot \sin A} = \frac{3}{4} \text{ bulunur.}$$

CEVAP C

31. $\cos B \cdot \cos C - \sin B \cdot \sin C = -0,8$

$$\cos(B+C) = -\frac{8}{10} = -\frac{4}{5} \text{ ise}$$

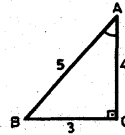
$$90^\circ < B+C < 180^\circ \text{ dir.}$$

$$B+C = 180^\circ - A$$

$$\cos(B+C) = \cos(180^\circ - A)$$

$$= -\cos A = -\frac{4}{5} \Rightarrow$$

$$\cos A = \frac{4}{5} \text{ olur.}$$



$$\sin A = \frac{3}{5}$$

$$\sin 2A = 2 \cdot \sin A \cdot \cos A$$

$$= 2 \cdot \frac{3}{5} \cdot \frac{4}{5}$$

$$= \frac{24}{25} \text{ bulunur.}$$

CEVAP E

32. Sinüs teoremine göre,

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

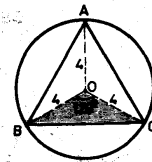
$$\frac{6}{\sin A} = \frac{8}{\sin(2A)} \text{ yazılır.}$$

$$\frac{6}{\sin A} = \frac{8}{2 \cdot \sin A \cos A}$$

$$6 = \frac{4}{\cos A} \Rightarrow \cos A = \frac{2}{3} \text{ bulunur.}$$

CEVAP A

33.



$$A(ABC) = 3 \cdot A(OBC) \text{ dir.}$$

$$= 3 \cdot \frac{1}{2} \cdot 4 \cdot 4 \cdot \sin 120^\circ$$

$$= 24 \cdot \frac{\sqrt{3}}{2}$$

$$= 12 \cdot \sqrt{3} \text{ cm}^2 \text{ bulunur.}$$

CEVAP E

34. $b(a^2 - b^2) = c(a^2 - c^2)$

$$a^2b - b^3 = a^2c - c^3$$

$$a^2b - a^2c = b^3 - c^3$$

$$a^2(b-c) = (b-c)(b^2 + bc + c^2)$$

$$a^2 = b^2 + bc + c^2 \text{ olur.}$$

Kosinüs teoreminden,

$$a^2 = b^2 + c^2 - 2bc \cos A \text{ yazılarak,}$$

$$b^2 + c^2 - 2bc \cos A = b^2 + c^2 + bc$$

$$\cos A = -\frac{1}{2} \Rightarrow$$

$$A = \frac{2\pi}{3} \text{ bulunur.}$$

CEVAP D

35. $x = 2$ alınırsa;

$$a = 2^2 - 1 = 3,$$

$$b = 2^2 + 2 + 1 = 7 \text{ ve}$$

$$c = 2 \cdot 2 + 1 = 5 \text{ olur.}$$

Kosinüs teoremine göre,

$$b^2 = a^2 + c^2 - 2ac \cdot \cos B$$

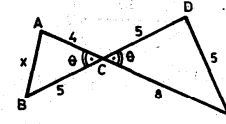
$$7^2 = 3^2 + 5^2 - 2 \cdot 3 \cdot 5 \cdot \cos B$$

$$49 = 9 + 25 - 30 \cdot \cos B$$

$$\cos B = -\frac{1}{2} \Rightarrow \widehat{B} = \frac{2\pi}{3} \text{ olur.}$$

CEVAP E

36.



DCE ve ABC üçgenlerinde kosinüs teoremine göre,

$$\cos \theta = \frac{8^2 + 5^2 - 5^2}{2 \cdot 8 \cdot 5} = \frac{4}{5} \text{ ve}$$

$$\cos \theta = \frac{5^2 + 4^2 - x^2}{2 \cdot 5 \cdot 4} \text{ yazılır.}$$

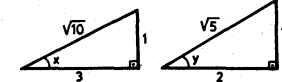
$$\frac{4}{5} = \frac{25 + 16 - x^2}{40}$$

$$4 = \frac{41 - x^2}{8} \Rightarrow x^2 = 9$$

$$x = 3 \text{ bulunur.}$$

CEVAP B

37.



$$\tan x = \frac{1}{3}$$

$$\cot y = 2$$

$$\sin x = \frac{1}{\sqrt{10}}$$

$$\sin y = \frac{1}{\sqrt{5}}$$

$$\cos x = \frac{3}{\sqrt{10}}$$

$$\cos y = \frac{2}{\sqrt{5}}$$

$$\theta = x + y$$

$$\sin \theta = \sin(x + y)$$

$$= \sin x \cdot \cos y + \cos x \cdot \sin y$$

$$= \frac{1}{\sqrt{10}} \cdot \frac{2}{\sqrt{5}} + \frac{3}{\sqrt{10}} \cdot \frac{1}{\sqrt{5}}$$

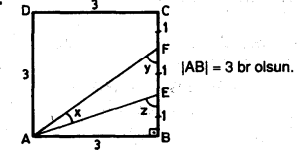
$$= \frac{2}{\sqrt{50}} + \frac{3}{\sqrt{50}}$$

$$= \frac{5}{\sqrt{50}} = \frac{5}{5\sqrt{2}}$$

$$= \frac{\sqrt{2}}{2} \text{ bulunur.}$$

CEVAP A

38.



$$z = x + y$$

$$\tan z = \tan(x + y) = 3 \text{ olur.}$$

$$\frac{\tan x + \tan y}{1 - \tan x \cdot \tan y} = 3$$

$$\frac{\tan x + \frac{3}{2}}{1 - \tan x \cdot \frac{3}{2}} = 3$$

$$1 - \tan x \cdot \frac{3}{2}$$

$$\tan x + \frac{3}{2} = 3 - \frac{9}{2} \cdot \tan x$$

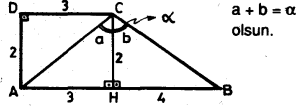
$$\frac{11}{2} \cdot \tan x = \frac{3}{2}$$

$$\tan x = \frac{3}{11} \text{ bulunur.}$$

CEVAP E

TRİGONOMETRİ

39.

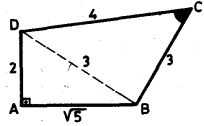


tana = tan (a + b)

$$\begin{aligned} &= \frac{\tan a + \tan b}{1 - \tan a \cdot \tan b} \\ &= \frac{\frac{3}{2} + \frac{4}{2}}{1 - \frac{3}{2} \cdot \frac{4}{2}} \\ &= \frac{\frac{7}{2}}{1 - 3} = \frac{7}{-2} \\ &= -\frac{7}{4} \text{ bulunur.} \end{aligned}$$

CEVAP A

40.



$$|BD|^2 = 2^2 + (\sqrt{5})^2 = 9$$

$|BD| = 3$ cm olur.

BDC üçgeninde kosinüs teoremine göre,

$$\cos C = \frac{4^2 + 3^2 - 3^2}{2 \cdot 4 \cdot 3} = \frac{16}{24}$$

$$\cos C = \frac{2}{3} \text{ bulunur.}$$

CEVAP B

41. $\tan 4x = \cot 50^\circ$ ise,
 $\tan 4x = \tan 40^\circ$ yazılır.

$$4x = 40^\circ + k \cdot 180^\circ \quad k \in \mathbb{Z}$$

$$\begin{aligned} k = 0 &\Rightarrow x_1 = 10^\circ, \\ k = 1 &\Rightarrow x_2 = 55^\circ, \\ k = 2 &\Rightarrow x_3 = 100^\circ \text{ ve} \\ k = 3 &\Rightarrow x_4 = 145^\circ \text{ olup} \end{aligned}$$

$$x_1 + x_2 + x_3 + x_4 = 310^\circ \text{ bulunur.}$$

CEVAP E

Temel Çalışma Soruları - 02 - çözümler

42. $\cos x + \sin x - \sqrt{2} = 0$

$$\cos x + \sin x = \sqrt{2}$$

$$(\cos x + \sin x)^2 = (\sqrt{2})^2$$

$$\underbrace{\cos^2 x + \sin^2 x}_1 + 2 \cdot \sin x \cos x = 2$$

$$1 + \sin 2x = 2$$

$$\sin 2x = 1$$

$$\sin 2x = \sin \frac{\pi}{2}$$

$$2x = \frac{\pi}{2} + 2k\pi \quad k \in \mathbb{Z}$$

$$k = 0 \Rightarrow x_1 = \frac{\pi}{4},$$

$$k = 1 \Rightarrow x_2 = \frac{5\pi}{4},$$

$$k = 2 \Rightarrow x_3 = \frac{9\pi}{4},$$

$$\vdots$$

Öyle ise en küçük pozitif kök

$$x_1 = \frac{\pi}{4} \text{ olur.}$$

CEVAP C

43. $2 \cdot \cos^2 x - 7 \cos x - 4 = 0$ denkleminde,

$$\cos x = t \text{ dersek,}$$

$$2t^2 - 7t - 4 = 0 \text{ denklemini yazılır.}$$

$$(t - 4)(2t + 1) = 0$$

$$t = 4 \text{ veya } t = -\frac{1}{2} \text{ olup}$$

$$\cos x = t = -\frac{1}{2} = \cos \frac{2\pi}{3} \Rightarrow$$

$$x = \frac{2\pi}{3} \text{ ve}$$

$$\frac{2\pi}{3} \in (0, \pi) \text{ dir.}$$

CEVAP D

TRİGONOMETRİ

44. $4 \sin x - \cos 2x + 3 = 0$

$$4 \cdot \sin x - (1 - 2\sin^2 x) + 3 = 0$$

$$4 \cdot \sin x - 1 + 2\sin^2 x + 3 = 0$$

$$2 \cdot \sin^2 x + 4\sin x + 2 = 0$$

$$\sin^2 x + 2\sin x + 1 = 0$$

$$\sin x = t \text{ diyelim.}$$

$$t^2 + 2t + 1 = 0$$

$$(t + 1)^2 = 0$$

$$t + 1 = 0 \Rightarrow t = -1 \text{ olur.}$$

$$\sin x = t = -1 = \sin \frac{3\pi}{2}$$

$$x = \frac{3\pi}{2} \text{ bulunur.}$$

CEVAP D

45. $\sin x + \sin 2x + \sin 3x = 0$

$$2 \cdot \sin \frac{x + 3x}{2} \cdot \cos \frac{3x - x}{2} + \sin 2x = 0$$

$$2 \cdot \sin 2x \cdot \cos x + \sin 2x = 0$$

$$\sin 2x \cdot (2 \cos x + 1) = 0$$

$$\sin 2x = 0 \text{ ya da } 2 \cos x + 1 = 0 \text{ dir.}$$

$$\sin 2x = 0 \Rightarrow x_1 = 0$$

$$x_2 = \frac{\pi}{2}$$

$$x_3 = \pi$$

olur.

$$2 \cos x + 1 = 0 \text{ ve}$$

$$\cos x = -\frac{1}{2} \text{ ise,}$$

$$x_4 = \frac{2\pi}{3}$$

$$x_5 = \frac{4\pi}{3}$$

olmak üzere,

denklemin sağlayan 5 tane kök bulunur.

CEVAP E

Temel Çalışma Soruları - 02 - çözümler

46. $\cos 2x + 4 \cos^2 x = 2 \cdot \sin 2x$

$$\cos^2 x - \sin^2 x + 4 \cos^2 x = 4 \cdot \sin x \cos x$$

$$5 \cdot \cos^2 x - \sin^2 x = 4 \cdot \sin x \cos x$$

Eşitliğin iki tarafı $\cos^2 x$ ile bölünürse,

$$\frac{5 \cos^2 x}{\cos^2 x} - \frac{\sin^2 x}{\cos^2 x} = \frac{4 \cdot \sin x \cdot \cos x}{\cos^2 x}$$

$$5 - \tan^2 x = 4 \tan x$$

$$\tan^2 x + 4 \tan x - 5 = 0 \text{ denkleminde}$$

elde edilir. $\tan x = t$ diyelim.

$$t^2 + 4t - 5 = 0$$

$$(t - 1)(t + 4) = 0$$

$$t_1 = 1 \text{ ya da } t_2 = -5 \text{ olur.}$$

$$\tan x = t = 1 \Rightarrow x = \frac{\pi}{4} \text{ bulunur.}$$

CEVAP A

47. $\log_3 (2 \cdot \sin 2x) = 0,5$ ise,

$$3^{0,5} = 2 \cdot \sin 2x = 3^{1/2}$$

$$2 \cdot \sin 2x = \sqrt{3}$$

$$\sin 2x = \frac{\sqrt{3}}{2} \text{ yazılır.}$$

$$\sin 2x = \sin \frac{\pi}{3} \text{ ya da}$$

$$\sin 2x = \sin \frac{2\pi}{3} \text{ olmalıdır.}$$

$$2x = \frac{\pi}{3},$$

$$2x = \frac{2\pi}{3},$$

$$x_1 = \frac{\pi}{6}$$

$$x_2 = \frac{\pi}{3}$$

$$2x = \frac{\pi}{3} + 2\pi$$

$$2x = \frac{2\pi}{3} + 2\pi$$

$$x_3 = \frac{7\pi}{6}$$

$$x_4 = \frac{4\pi}{3}$$

$$x_1 + x_2 + x_3 + x_4 = \frac{\pi}{6} + \frac{\pi}{3} + \frac{7\pi}{6} + \frac{4\pi}{3}$$

$$= 3\pi \text{ bulunur.}$$

CEVAP E

48. $\text{Arccos}\left(\frac{2x}{3} - 4\right)$ ifadesi tanımlı ise,

$$-1 \leq \frac{2x}{3} - 4 \leq 1 \text{ olmalıdır.}$$

$$-1 + 4 \leq \frac{2x}{3} \leq 1 + 4$$

$$3 \leq \frac{2x}{3} \leq 5$$

$$9 \leq 2x \leq 15$$

$$\frac{9}{2} \leq x \leq \frac{15}{2} \text{ ve } x \in \mathbb{Z}$$

$$x \in \{5, 6, 7\} \text{ olur.}$$

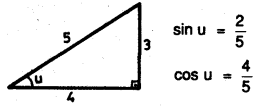
$$\text{Toplam} = 5 + 6 + 7 = 18 \text{ bulunur.}$$

CEVAP E

49. $\cos\left(\frac{\pi}{2} - \arctan 0,75\right) = ?$

$$\arctan 0,75 = \arctan \frac{3}{4} = u \text{ olsun.}$$

$$\tan u = \frac{3}{4} \text{ olur.}$$



$$\cos\left(\frac{\pi}{2} - \arctan 0,75\right) = \cos\left(\frac{\pi}{2} - u\right) = \sin u$$

$$= \frac{3}{5} \text{ bulunur.}$$

CEVAP C

50. $\tan\left(\arctan \frac{1}{2} + \text{arccot} \frac{2}{3}\right) = ?$

$$\arctan \frac{1}{2} = u \text{ ve } \text{arccot} \frac{2}{3} = v \text{ olsun.}$$

$$\tan u = \frac{1}{2}, \quad \cot v = \frac{2}{3} \text{ ve}$$

$$\tan v = \frac{3}{2} \text{ olur.}$$

$$\tan\left(\arctan \frac{1}{2} + \text{arccot} \frac{2}{3}\right) = \tan(u + v)$$

$$= \frac{\tan u + \tan v}{1 - \tan u \cdot \tan v}$$

$$= \frac{\frac{1}{2} + \frac{3}{2}}{1 - \frac{1}{2} \cdot \frac{3}{2}}$$

$$= \frac{2}{\frac{1}{4}}$$

$$= 8 \text{ bulunur.}$$

CEVAP E