

$$6 \times 30^\circ = 180^\circ$$

$$4 \times 45^\circ = 180^\circ$$

$$54 \div 2 = 27^\circ$$

$$30 - 27 = 3^\circ$$

$$180 + 24 + 3 = 207^\circ$$

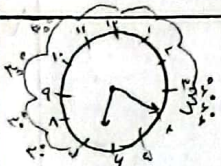
$$360 - 207 = 153^\circ$$

جواب

ب) $\alpha = |5/5m - 20h| \rightarrow \alpha = \left| \frac{5/5 \times 45}{12} - \frac{20 \times 2}{12} \right| = 207^\circ$

$$360 - 207 = 153^\circ$$

جواب



ا) $30^\circ \times 1 = 30^\circ$

$$4 \times 45^\circ = 180^\circ$$

$$18 \div 2 = 9$$

$$30 - 9 = 21^\circ$$

$$240 + 21 + 11 = 271^\circ$$

$$360 - 271 = 89^\circ$$

جواب

ب) $\alpha = |5/5m - 20h| \rightarrow \alpha = \left| \frac{5/5 \times 18}{12} - \frac{20 \times 4}{12} \right| = 11^\circ$ جواب

ا) $S = \frac{\pi}{r} R^2 \rightarrow S = \frac{\pi}{\frac{1}{r}} \times r^2 \rightarrow S = \frac{\pi}{\frac{1}{r}} \times r^2 \rightarrow S = \frac{\pi}{r}$ جواب

ب) $P = \alpha R + rR \rightarrow P = \frac{\pi}{r} \times r^2 + \frac{r \times r^2}{r} \rightarrow P = \frac{\pi}{r} + r \rightarrow P = \frac{12 + \pi}{r}$ جواب

ا) $S = \frac{1}{2} ab \sin \alpha \rightarrow S = \frac{1}{2} \times 4 \times 4 \times \frac{\sqrt{3}}{2} \rightarrow S = 10\sqrt{3}$ جواب

ب) $c = \sqrt{a^2 + b^2 - 2ab \cos \alpha} \rightarrow c = \sqrt{4^2 + 4^2 - 2 \times 4 \times 4 \times \frac{1}{2}} = \sqrt{16 + 16 - 16} = \sqrt{16} = 4$

$P = a + b + c \rightarrow P = 4 + 4 + 4 = 12$ جواب

$B + C = 150^\circ \rightarrow A = 180 - 150 = 30^\circ$

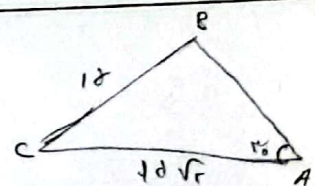
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$\frac{10}{\frac{1}{2}} = \frac{10\sqrt{3}}{\sin B} \rightarrow \sin B = \frac{\sqrt{3}}{2} \rightarrow B = 60^\circ$

$A + C = 150^\circ \rightarrow C = 120^\circ$

$\frac{10}{180} = \frac{\text{rad}}{\pi} \rightarrow \text{rad}_B = \frac{\pi}{6}$

$\text{rad}_C = \frac{120\pi}{180} = \frac{2\pi}{3} = \frac{2\pi}{3}$



$$\frac{\tan(\pi - \alpha) + r \tan(\pi + \alpha)}{\tan(r\pi - \alpha) - \tan(r\pi + \alpha)} = \frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-2 \tan \alpha} = -1$$

$A = \frac{r \tan 90^\circ + \tan 60^\circ}{r \tan 120^\circ - \tan 30^\circ}$

$\tan \frac{\pi}{12} = a \rightarrow \frac{\pi}{12} = \frac{p}{180} \rightarrow D = 15^\circ \rightarrow a = \tan 15^\circ \quad \cot 15 = \frac{1}{a}$

$$\frac{r \tan(90 - 15) + \tan(90 + 15)}{r \tan(180 - 15) - \tan(270 - 15)} = \frac{r \cot 15 - \cot 15}{-r \tan 15 - \cot 15} = \frac{\cot 15}{-r \tan 15 - \cot 15} = \frac{1/a}{-r(a) - 1/a} = \frac{1/a}{-ra - 1/a} = \frac{1/a}{\frac{-ra^2 - 1}{a}} = \frac{1}{-ra^2 - 1}$$

$\frac{-1}{ra^2 + 1} = A$

$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = 2 \quad \xrightarrow{\text{تخمین مشترک مخرج}} \frac{(\sin x + \cos x)^2 + (\sin x - \cos x)^2}{\sin^2 x - \cos^2 x} = 2$$

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

$$2 = 2 - 2 \cos^2 x - 2 \cos^2 x \rightarrow 4 \cos^2 x = 1 \rightarrow \cos^2 x = \frac{1}{4}$$

$$\tan^2 x + 1 = \frac{1}{\frac{1}{4}} \rightarrow \tan^2 x + 1 = 4 \rightarrow \tan^2 x = 3 \quad \text{جواب}$$

$$\frac{1 - \cos^2 x}{\sin^2 x - 2 \cos^2 x + 1} = 4 \quad \xrightarrow{\tan^2 x = 3} \frac{1 - \cos^2 x - 2 \cos^2 x + 1}{1 - \cos^2 x + 2 \cos^2 x - 1} = 4 \rightarrow \frac{2 - 3 \cos^2 x}{\cos^2 x} = 4$$

$$2 - 3 \cos^2 x = 4 \cos^2 x \rightarrow 2 = 7 \cos^2 x \rightarrow \cos^2 x = \frac{2}{7}$$

$$\tan^2 x + 1 = \frac{1}{\cos^2 x} \rightarrow \tan^2 x + 1 = \frac{1}{\frac{2}{7}} \rightarrow \tan^2 x + 1 = \frac{7}{2} \rightarrow \tan^2 x = \frac{5}{2} \quad \text{جواب}$$

$$\cos(2\pi/3) = \cos^2 x = \frac{1 + \cos 2x}{2} \rightarrow \cos x = \sqrt{\frac{1 + \cos 2x}{2}}$$

$$\cos \pi/3 = \sqrt{\frac{1 + \cos \pi}{2}} = \cos \pi/3 = \sqrt{\frac{1 + \frac{-1}{2}}{2}} = \sqrt{\frac{\frac{1}{2}}{2}} = \sqrt{\frac{1}{4}} = \frac{1}{2} \quad \text{جواب}$$

$$\sin(4\pi/3) \rightarrow \sin^2 x = \frac{1 - \cos 2x}{2} \rightarrow \sin x = \sqrt{\frac{1 - \cos 2x}{2}} \Rightarrow \sin x = \sqrt{\frac{1 - \cos \pi}{2}}$$

$$\sin x = \sqrt{\frac{1 - (-1)}{2}} = \sqrt{\frac{2}{2}} = \sqrt{1} = 1 \quad \text{جواب}$$