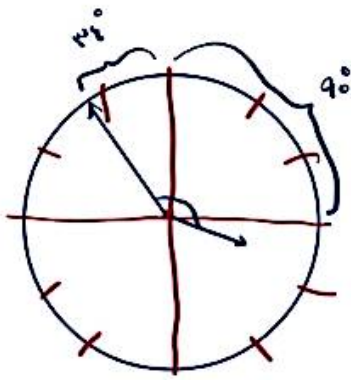


## سوال ۱



$$37^\circ \text{ در } \Delta E' \rightarrow \frac{OE'}{r} = \sin 37^\circ$$

$$\frac{OE'}{12} = \frac{4}{5} \rightarrow OE' = 9.6 \text{ cm}$$

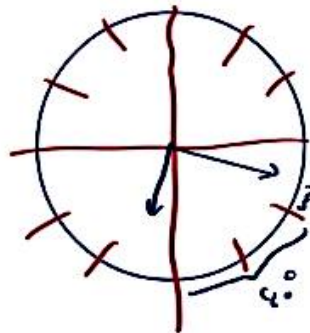
با فرض اول:

$$\alpha = |51.5^\circ - 37^\circ| = 14.5^\circ$$

$$\frac{11}{12} \times \frac{12}{12} - \frac{3}{12} \times \frac{12}{12} = \frac{11}{12} - \frac{3}{12} = \frac{8}{12} = \frac{2}{3}$$

از این نوعی

## سوال ۲



با فرض اول:

$$40^\circ \text{ در } \Delta A' \rightarrow \frac{A'O}{r} = \sin 40^\circ$$

$$\frac{A'O}{12} = \frac{4}{5} \rightarrow A'O = 9.6 \text{ cm}$$

با فرض دوم:

$$\alpha = |51.5^\circ - 40^\circ| = 11.5^\circ$$

$$\frac{11}{12} \times \frac{12}{12} - \frac{3}{12} \times \frac{12}{12} = \frac{11}{12} - \frac{3}{12} = \frac{8}{12} = \frac{2}{3}$$

## سوال ۳

$$S = \frac{\alpha}{r} R^2 = \frac{\pi}{4} \times 9 = \frac{\pi}{12} \times 9 = \frac{\pi}{4} \times 9 = \frac{9\pi}{4}$$

$$|AB| = \alpha R = \frac{\pi}{4} \times 9 = \frac{9\pi}{4}$$

$$L = AB + OB + OA = 9 + 9 + \frac{9\pi}{4} = 18 + \frac{9\pi}{4}$$

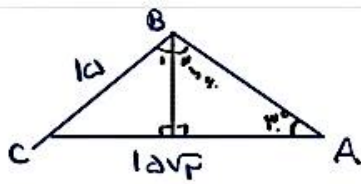
## سوال ۴



$$S_{ABC} = \frac{1}{2} AC \times AB \times \sin \hat{A} = \frac{1}{2} \times 4 \times 3 \times \sin 90^\circ = 6$$

$$CB = \sqrt{(AC)^2 + (AB)^2 - 2(AC)(AB)(\cos 90^\circ)} = \sqrt{4^2 + 3^2 - 0} = \sqrt{16 + 9} = \sqrt{25} = 5$$

$$P_{ABC} = 4 + 3 + 5 = 12$$



سوال ۵ :

$$\hat{B} + \hat{C} = 150^\circ$$

$$\hat{B} + \hat{C} + \hat{A} = 180^\circ$$

$$A = 30^\circ$$

$$\frac{BC}{\sin A} = \frac{CA}{\sin B} \rightarrow \frac{10}{\sin 30^\circ} = \frac{12\sqrt{2}}{\sin B} \rightarrow \sin B = \frac{12\sqrt{2}}{20} \rightarrow \sin B = \frac{3\sqrt{2}}{5}$$

$$\hat{B} = \sin^{-1}\left(\frac{3\sqrt{2}}{5}\right)$$

$$\hat{B} = 45^\circ \text{ or } 135^\circ$$

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

سوال ۶ :

$$\tan \frac{\pi}{18} = \alpha \text{ then } \alpha = 10^\circ$$

$$\frac{r \tan 10^\circ + \tan 10^\circ}{r \tan 10^\circ - \tan 10^\circ} = \frac{r(2 \tan 10^\circ) + \tan 10^\circ}{r(2 \tan 10^\circ) - \tan 10^\circ} = \frac{10 \tan 10^\circ}{14 \tan 10^\circ} = \frac{10}{14}$$

سوال ۷ :

$$\frac{\sin m + \cos m}{\sin m - \cos m} + \frac{\sin m - \cos m}{\sin m + \cos m} = r \rightarrow \frac{(\sin m + \cos m)^2 + (\sin m - \cos m)^2}{\sin^2 m - \cos^2 m} = r$$

$$\frac{\sin^2 m + \cos^2 m + r \sin m \cos + \sin^2 m + \cos^2 m - r \sin m \cos}{\sin^2 m - \cos^2 m} = \frac{r}{1}$$

$$\left. \begin{array}{l} \sin^2 m - \cos^2 m = \frac{r}{1} \\ \sin^2 m + \cos^2 m = 1 \end{array} \right\} \rightarrow \frac{\sin^2 m + \cos^2 m}{\cos^2 m + \frac{r}{1}} = \frac{1}{\frac{r}{1}} \rightarrow 1 + \tan^2 m = \frac{1}{\cos^2 m} \rightarrow \tan^2 m = \frac{1}{\cos^2 m} - 1 = \frac{1 - \cos^2 m}{\cos^2 m} = \frac{\sin^2 m}{\cos^2 m} \rightarrow \tan m = \frac{\sin m}{\cos m} = \frac{r}{1}$$

$$\star \sin^2 m + \cos^2 m = 1$$

$$\cos^2 m = 1 - \sin^2 m$$

$$\sin^2 m = 1 - \cos^2 m$$

$$\tan^2 m = \frac{1}{\cos^2 m}$$

$$\frac{\sin^2 m - r \cos^2 m + 1}{\sin^2 m + r \cos^2 m - 1} = \frac{1 - \cos^2 m - r \cos^2 m + 1}{1 - \cos^2 m + r \cos^2 m - 1} = \frac{r - r \cos^2 m}{\cos^2 m} = \frac{r}{1}$$

$$r - r \cos^2 m = r \cos^2 m \rightarrow \cos^2 m = \frac{r}{2} \rightarrow \cos m = \frac{\sqrt{r}}{2}$$

$$\cos\left(\frac{\pi}{4}, 0^\circ\right) = \frac{\sqrt{r+1}}{2}$$

$$\sin(45^\circ) = \cos(45^\circ) = \frac{\sqrt{r+1}}{2}$$

سوال ۹ :

سوال ۱۰ :