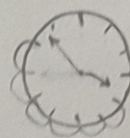


$$4 \times 30 = 120 \quad 4 \times 6 = 24 \quad 54 \div 2 = 27 \quad 120 - 27 = 93$$

$$120 + 24 + 3 = 147 \quad 360 - 147 = 213$$



(الف)

$$|5/5 \times 54 + 30 \times 3| = |270 - 90| = 180 \quad 360 - 180 = 180$$

(ب)

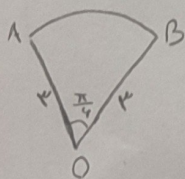
$$2 \times 30 = 60 \quad 18 \div 2 = 9 \quad 2 \times 4 = 8 \quad 90 + 9 + 12 = 111$$



(الف)

$$|5/5 \times 18 - 30 \times 4| = 18$$

(ب)

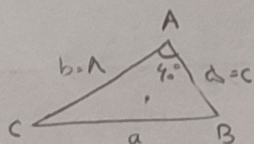


$$\frac{\pi}{r} \times r^2 = \frac{\pi}{4} \times 9 = \frac{\pi}{12} \times 9 = \frac{9\pi}{12} = \frac{3\pi}{4}$$

$$|AB| = \frac{\pi}{4} \times r = \frac{\pi}{4} \quad r + r + \frac{\pi}{4} = 9 + \frac{\pi}{4}$$

(الف)

(ب)



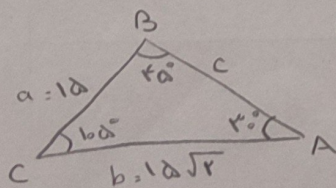
$$S = \frac{1}{2} bc \sin A \Rightarrow \frac{1}{2} \times 1 \times \sqrt{2} \times \frac{\sqrt{2}}{2} = 1 \times \frac{\sqrt{2}}{2} = 1 \times \frac{\sqrt{2}}{2}$$

(الف)

$$a^2 = \sqrt{c^2 + b^2 - 2cb \cos A} = \sqrt{1^2 + 1^2 - 2 \times 1 \times 1 \times \frac{1}{2}} = \sqrt{2 - 1} = \sqrt{1} = 1 \Rightarrow a = 1$$

(ب)

$$P = 1 + 1 + 1 = 3$$



$$B + C = 180 \Rightarrow A = 20$$

$$\frac{10}{1} = \frac{10\sqrt{2}}{\sin b} \Rightarrow 10 \sin b = \frac{10\sqrt{2}}{2} \Rightarrow \sin b = \frac{\sqrt{2}}{2} \Rightarrow b = 45$$

$$B = \frac{\pi}{4}$$

$$C = \frac{10 - 20}{10} = \frac{-10}{10} = -1 \text{ rad} = 10 \text{ rad} = 10 \times \pi \Rightarrow \frac{10}{10} \pi = \pi$$

$$180 - 45 = 135 = C$$

$$\frac{10\pi}{10}$$

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

9

$$\tan \frac{\pi}{11} = a$$

$$A = \frac{r \tan 10^\circ + \tan 10^\circ}{r \tan 190^\circ - \tan 10^\circ} \Rightarrow A = \frac{r \tan(90^\circ - 10^\circ) + \tan(90^\circ - 10^\circ)}{r \tan(180^\circ - 10^\circ) - \tan(r \cdot 10^\circ - 10^\circ)}$$

$$\frac{D}{180} = \frac{\frac{\pi}{11}}{\pi} \Rightarrow D = 10^\circ$$

$$A = \frac{r \cot 10^\circ - \cot 10^\circ}{-r \tan 10^\circ - \cot 10^\circ} \Rightarrow \frac{\cot 10^\circ}{-r \tan 10^\circ - \cot 10^\circ} \Rightarrow$$

$$\frac{\cot 10^\circ}{-r a - \cot 10^\circ} \Rightarrow \frac{\frac{1}{a}}{-r a - \frac{1}{a}} = \frac{1}{-r a^2 - 1}$$

$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = r \quad \frac{\sin^2 x + r \sin x \cos x + \cos^2 x + \sin^2 x - r \sin x \cos x + \cos^2 x}{\sin^2 x - \cos^2 x} = r$$

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

$$\Rightarrow r (\sin^2 x - \cos^2 x) = r \Rightarrow \begin{cases} \sin^2 x - \cos^2 x = \frac{r}{r} \\ \sin^2 x + \cos^2 x = 1 \end{cases} \Rightarrow \sin^2 x = \frac{1}{2}, \cos^2 x = \frac{1}{2}$$

$$\tan^2 x = \frac{\frac{1}{2}}{\frac{1}{2}} = 1$$

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

$$\Rightarrow r \cos^2 x = r - r \cos^2 x \Rightarrow 2r \cos^2 x = r \Rightarrow \cos^2 x = \frac{1}{2} \quad \sin^2 x = 1 - \cos^2 x \Rightarrow$$

$$\sin^2 x = 1 - \frac{1}{2} \Rightarrow \sin^2 x = \frac{1}{2} \quad \tan^2 x = \frac{\frac{1}{2}}{\frac{1}{2}} = 1$$

9

$$\text{a) } \cos(r \cdot 10^\circ) \Rightarrow \cos^r(r \cdot 10^\circ) = \frac{1 + \cos 10^\circ}{r} \Rightarrow \frac{1 + \frac{\sqrt{r}}{r}}{r} = \frac{r + \sqrt{r}}{r^2} \Rightarrow$$

$$\cos(r \cdot 10^\circ) = \frac{\sqrt{r + \sqrt{r}}}{r}$$

$$\text{b) } \sin(4 \cdot 10^\circ) \Rightarrow \sin^r(4 \cdot 10^\circ) = \frac{1 - \cos 10^\circ}{r} \Rightarrow \frac{1 - \frac{\sqrt{r}}{r}}{r} = \frac{r - \sqrt{r}}{r^2} \Rightarrow$$

$$\sin(4 \cdot 10^\circ) = \frac{\sqrt{r - \sqrt{r}}}{r}$$

10