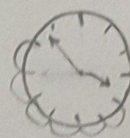


$4 \times 30 = 120$      $4 \times 6 = 24$      $54 \div 2 = 27$      $120 - 27 = 93$

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



(الف)

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

(ب)

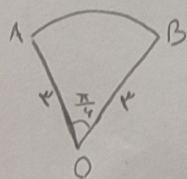
$2 \times 30 = 60$      $18 \div 2 = 9$      $2 \times 4 = 8$      $90 + 9 + 12 = 111$



(الف)

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

(ب)

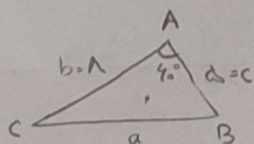


$\frac{\pi}{4} \times r^2 = \frac{\pi}{4} \times 9 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4}$

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

(الف)

(ب)



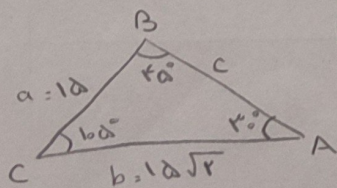
$S = \frac{1}{2} bc \sin A \Rightarrow \frac{1}{2} \times 1 \times \sqrt{2} \times \frac{\sqrt{2}}{2} = 1 \times \frac{\sqrt{2}}{2} = 1 \times \frac{\sqrt{2}}{2}$

(الف)

$a^2 = c^2 + b^2 - 2cb \cos A = a^2 \Rightarrow \sqrt{1 + 9 - 10 \times \frac{1}{2}} \Rightarrow a^2 = 4 \Rightarrow a = 2$

$P = 2 + 1 + 2 = 5$

(ب)



$B + C = 120 \Rightarrow A = 60$

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

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

$C = \frac{100}{180} = \frac{\pi}{1.8} \Rightarrow 100 \text{ rad} = 100 \pi \Rightarrow \frac{100}{1.8} \pi$

$120 - 45 = 75 = C$

$\frac{100\pi}{1.8}$

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

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

$$A = \frac{r \tan 10^\circ + \tan 10^\circ}{r \tan 190^\circ - \tan 10^\circ} \Rightarrow A = \frac{r \tan(90+10) + \tan(90+10)}{r \tan(180+10) - \tan(r90+10)}$$

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

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

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

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

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

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

$$\tan^2 x = \frac{\frac{1+r}{2}}{\frac{1-r}{2}} = \frac{1+r}{1-r}$$

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

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

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

$$\text{a) } \cos(r10^\circ) \Rightarrow \cos^r(r10^\circ) = \frac{1 + \cos 10^\circ}{r} \Rightarrow \frac{1 + \frac{\sqrt{r}}{r}}{r} = \frac{r + \sqrt{r}}{r^2} \Rightarrow$$

$$\cos(r10^\circ) = \frac{\sqrt{r + \sqrt{r}}}{r}$$

$$\text{b) } \sin(40^\circ) \Rightarrow \sin^r(40^\circ) = \frac{1 - \cos 10^\circ}{r} \Rightarrow \frac{1 - \frac{\sqrt{r}}{r}}{r} = \frac{r - \sqrt{r}}{r^2} \Rightarrow$$

$$\sin(40^\circ) = \frac{\sqrt{r - \sqrt{r}}}{r}$$