

$$8 \times 30 + 27 + 9 = 153$$

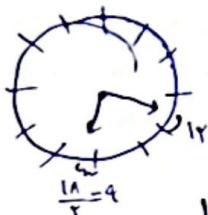
(الف)

۱

$$|8/8m - 30h| = |(8/8 \times 54) - (30 \times 9)| = 27$$

(ب)

$27 \times \frac{12}{1} = 153$



$$2 \times 30 + 12 + 9 = 11$$

(الف)

۲

$$|(8/8 \times 11) - (30 \times 9)| = 11$$

(ب)

$$S = \frac{1}{r} \alpha \times R^2 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4}$$

$$\widehat{AB} = R\alpha = 3 \times \frac{\pi}{4} = \frac{\pi}{4}$$

$$P = 2 \times 3 + \frac{\pi}{4} = 9 + \frac{\pi}{4}$$

۳

$$S = \frac{1}{r} \times \Delta \times 1 \times \sin 60 = 20 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$$

$$c^2 = a^2 + b^2 - 2ab \cos \alpha \Rightarrow c^2 = 25 + 49 - 2 \times 5 \times 7 \times \frac{1}{2} = 49 \Rightarrow c = 7$$

$$P = 2 + 1 + 7 = 10$$

۴

$$\frac{12}{\sin 30} = \frac{12\sqrt{2}}{\sin B} \rightarrow \sqrt{2} \sin 30 = \sin B \rightarrow \sqrt{2} \times \frac{1}{2} = \frac{\sqrt{2}}{2} \rightarrow B = 45^\circ \rightarrow \frac{\pi}{4}$$

$$\Rightarrow \hat{C} = 105^\circ$$

$$\frac{R_{\text{rad}}}{\pi} = \frac{105}{180} = \frac{7\pi}{12}$$

۵

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

6

$$\frac{r \tan V\delta + \tan 1\delta}{r \tan 1\delta - \tan r\delta} = \frac{r \tan(\frac{\pi}{r} - \delta) + \tan(\frac{\pi}{r} + \delta)}{r \tan(\pi - \delta) - \tan(\frac{\pi}{r} - \delta)} \quad \because \tan \frac{\pi}{r} = a$$

$$\downarrow$$

$$\tan 1\delta = a$$

7

$$\frac{r \cot 1\delta - \cot 1\delta}{-r \tan 1\delta - \cot 1\delta} = \frac{\cot 1\delta}{-r \tan 1\delta - \cot 1\delta} = \frac{\frac{1}{a}}{-ra - \frac{1}{a}} = \boxed{\frac{-1}{-ra^2 - 1}}$$

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

$$\rightarrow r = \frac{r \sin^2 r\alpha - r \cos^2 r\alpha}{\sin^2 r\alpha - \cos^2 r\alpha} = \frac{r \sin^2 r\alpha - r}{\sin^2 r\alpha - \cos^2 r\alpha} \rightarrow r \sin^2 r\alpha = \delta \rightarrow \sin^2 r\alpha = \frac{\delta}{r} \rightarrow \cos^2 r\alpha = \frac{1}{r}$$

1

$$1 + \tan^2 r\alpha = \frac{1}{\cos^2 r\alpha} \rightarrow 1 + \tan^2 r\alpha = r \rightarrow \tan^2 r\alpha = \delta$$

$$\frac{\sin^2 r\alpha - r \cos^2 r\alpha + 1}{\sin^2 r\alpha + r \cos^2 r\alpha} = \epsilon \rightarrow \frac{\sin^2 r\alpha + r \sin^2 r\alpha - r + 1}{\sin^2 r\alpha - r \sin^2 r\alpha + r - 1} = \epsilon \rightarrow \frac{r \sin^2 r\alpha - 1}{1 - \sin^2 r\alpha} = \epsilon$$

$$\epsilon - \epsilon \sin^2 r\alpha = r \sin^2 r\alpha - 1 \Rightarrow \delta = r \sin^2 r\alpha \rightarrow \sin^2 r\alpha = \frac{\delta}{r} \rightarrow \cos^2 r\alpha = \frac{1}{r}$$

9

$$1 + \tan^2 r\alpha = \frac{1}{\cos^2 r\alpha} \rightarrow 1 + \tan^2 r\alpha = \frac{r}{1} \rightarrow \tan^2 r\alpha = \frac{\delta}{r}$$

$$\omega) \cos 2r\delta \Rightarrow \cos^2 r\delta = \frac{1 + \cos 2\delta}{2} = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{\frac{r + \sqrt{r}}{r}}{2} = \frac{r + \sqrt{r}}{2r}$$

$$\rightarrow \cos 2r\delta = \sqrt{\frac{r + \sqrt{r}}{2r}} = \frac{\sqrt{r + \sqrt{r}}}{\sqrt{2r}}$$

10

$$\text{ب) } \sin 9V\delta \Rightarrow \sin 9V\delta = \cos 2r\delta = \frac{\sqrt{r + \sqrt{r}}}{\sqrt{2r}} \rightarrow \text{مطلوب}$$