

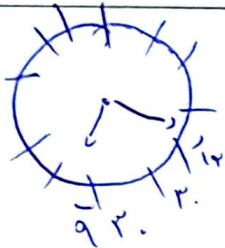
$$12. + 12. + 12. = 1080^\circ \quad \checkmark$$

(الف)

$$\alpha = |\omega_m - \omega_h| = |\omega_m \times 2 - 9.0| = 20.0$$

$$32. - 12. = 1080^\circ \quad \checkmark$$

(۲)



$$3. + 12. + 12. = 111^\circ \quad \checkmark$$

(الف) (۲)

$$|\omega_m - \omega_h| = |99 - 111| = 11^\circ \quad \checkmark$$

$$S = \frac{\alpha}{r} \times R^2 = \frac{\pi}{r} \times 9 = \frac{3\pi}{r} \quad \checkmark$$

(الف)

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

$$P = 3. + \frac{\pi}{r} = \frac{4\pi}{r} \quad \checkmark$$

(۲)

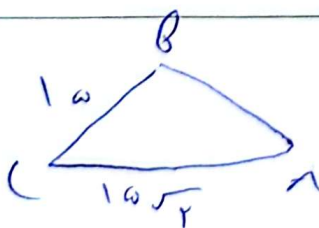
$$S = \frac{1}{r} AB \sin \alpha = \frac{1}{r} \times 11 \times \omega \times \frac{\sqrt{r}}{r} = 10\sqrt{3} \quad \checkmark$$

(الف)

$$C^2 = a^2 + b^2 - 2ab \cos \alpha \Rightarrow C^2 = 20 + 40 - 2 \times 10 \times \sqrt{2} \times \frac{1}{\sqrt{2}} = 19 - 2 = 17$$

$$\Rightarrow C = \sqrt{17} \Rightarrow P = 11 + \omega + \sqrt{17} = 20 \quad \checkmark$$

(۲)



$$\widehat{B} + \widehat{C} = 180^\circ$$

$$A(=10\sqrt{2})$$

$$B(=10)$$

$$\widehat{A} = 11.10. = 110^\circ$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{10}{\sin 110^\circ} = \frac{10\sqrt{2}}{\sin B} \Rightarrow \frac{10}{\sin 110^\circ} = \frac{10\sqrt{2}}{\sin B} \Rightarrow \frac{1}{\sin 110^\circ} = \frac{\sqrt{2}}{\sin B} \Rightarrow \sin B = \sqrt{2} \sin 110^\circ = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ \Rightarrow C = 100^\circ$$

(۲)

$$\frac{R_{\text{rad}}}{2\pi} = \frac{D}{1n.} \Rightarrow \widehat{B} = \frac{40}{1n.} = \frac{R_{\text{rad}}}{\frac{2\pi}{1n.}} \Rightarrow \widehat{B} = \frac{\pi}{r} \quad \checkmark$$

$$\frac{R_{\text{rad}}}{\pi} = \frac{D}{1n.} \Rightarrow \frac{1. \omega}{1n.} = \frac{R_{\text{rad}}}{\pi} \Rightarrow R_{\text{rad}} = \frac{\pi}{1r} \quad \checkmark$$

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

Y

$$\begin{aligned} \tan \frac{\pi}{r} = \alpha &\Rightarrow \tan \omega = \alpha \quad A = \frac{r \tan \omega + \tan \omega}{r \tan \omega - \tan \omega} = \frac{r \tan(\frac{\pi}{r} - \omega) + \tan(\frac{\pi}{r} + \omega)}{r \tan(\frac{\pi}{r} - \omega) - \tan(\frac{\pi}{r} + \omega)} \\ &= \frac{r \cot \omega - \cot \omega}{-r \cot \omega - \cot \omega} = \frac{r + 1}{-r - 1} = \frac{1}{-1} = \boxed{-1} \checkmark \end{aligned}$$

Y

$$\begin{aligned} \frac{\sin x + c \cdot s x}{\sin x - c \cdot s x} + \frac{\sin x - c \cdot s x}{\sin x + c \cdot s x} = r &\Rightarrow \frac{(\sin x + c \cdot s x)^2 + (\sin x - c \cdot s x)^2}{\sin^2 x - c^2 s^2 x} = r \\ \Rightarrow \frac{r}{\sin^2 x - c^2 s^2 x} = r &\Rightarrow \sin^2 x - c^2 s^2 x = \frac{r}{r} = 1 \\ \sin^2 x + c^2 s^2 x = 1 &\Rightarrow c \cdot s x = \frac{1}{r} \quad \sin^2 x = \frac{r-1}{r} \\ \tan^2 x = \frac{\sin^2 x}{c \cdot s x} &= \frac{\frac{r-1}{r}}{\frac{1}{r}} = \frac{r-1}{1} = \boxed{r-1} \checkmark \end{aligned}$$

Y

$$\begin{aligned} \frac{\sin^2 x - r(c \cdot s x)^2}{\sin^2 x + r(c \cdot s x)^2} = r &\Rightarrow \frac{r - r^2 c^2 s^2 x}{1 - c^2 s^2 x + r^2 c^2 s^2 x} = r \\ \Rightarrow \frac{r}{c \cdot s x} - \frac{r^2 c \cdot s x}{c \cdot s x} = r &\Rightarrow \frac{r}{c \cdot s x} = r + r^2 c \cdot s x \\ \Rightarrow c \cdot s x = \frac{r}{r + r^2 c \cdot s x} &\Rightarrow c \cdot s x = \frac{1}{1 + r c \cdot s x} \\ \Rightarrow \sin^2 x = \frac{1}{1 + r c \cdot s x} &\Rightarrow \sin^2 x = \frac{1}{1 + r c \cdot s x} \\ \tan^2 x = \frac{\sin^2 x}{c \cdot s x} &= \frac{\frac{1}{1 + r c \cdot s x}}{\frac{1}{1 + r c \cdot s x}} = \boxed{1} \checkmark \end{aligned}$$

Y

$$\begin{aligned} \text{الف) } c \cdot s \frac{\pi}{r} &= c \cdot s \alpha = \frac{1 + c \cdot s \alpha}{r} \Rightarrow c \cdot s \frac{\pi}{r} = \frac{1 + c \cdot s \alpha}{r} = \frac{1 + \frac{\sqrt{r}}{r}}{r} \\ \Rightarrow c \cdot s \frac{\pi}{r} &= \sqrt{\frac{1 + \frac{\sqrt{r}}{r}}{r}} = \sqrt{\frac{r + \sqrt{r}}{r^2}} = \frac{\sqrt{r + \sqrt{r}}}{r} \checkmark \\ \Rightarrow \sin(\frac{\pi}{r}) &= \sin(\frac{\pi}{r} - \frac{\pi}{r}) = c \cdot s \frac{\pi}{r} = \frac{\sqrt{r + \sqrt{r}}}{r} \checkmark \end{aligned}$$

Y