

۱ (الف)

$$|\omega, am - \psi_0 h|$$

$$\left| \frac{\omega(2)}{24} - \frac{\psi_0(3)}{90} \right| = \left| \frac{20}{24} - \frac{30}{90} \right| = \left| \frac{5}{6} - \frac{1}{3} \right| = \left| \frac{10}{12} - \frac{4}{12} \right| = \left| \frac{6}{12} \right| = \left| \frac{1}{2} \right| = 180^\circ$$

۳۰ + ۳۰ + ۳۰ + ۳۰ = ۱۲۰
+ ۲۷ + ۹ = ۱۵۶

۲ (الف)

$$|\omega, am - \psi_0 h|$$

$$\left| \frac{\omega(18)}{99} - \frac{\psi_0(4)}{180} \right| = \left| -\frac{11}{180} \right| = 11^\circ$$

۹ + ۳۰ + ۳۰ + ۱۲ = ۸۱

۳ (الف)

$$S = \frac{\alpha}{r} R^2 = \frac{\pi}{4} \times \frac{3}{4} = \frac{3\pi}{16}$$

$$\frac{1}{4} \times R = \frac{\pi}{4} \times 3 = \frac{\pi}{2} \Rightarrow p = \frac{\pi}{4} + \frac{\pi}{4} = \frac{\pi}{2}$$

۴ (الف)

$$S = \frac{1}{r} \times \omega \times \frac{3}{4} = 10\sqrt{3}$$

$$BC = \sqrt{1^2 + 5^2 - 2(1)(5)(\frac{1}{2})} = \sqrt{21}$$

$$p = 7 + 5 + 1 = 13$$

۵

$$\hat{B} + \hat{C} = 180^\circ \Rightarrow \hat{A} = 30^\circ$$

$$\frac{10}{\sin 30^\circ} = \frac{10\sqrt{2}}{\sin \hat{B}} \rightarrow \psi_0 = \frac{10\sqrt{2}}{\sin \hat{B}} \Rightarrow \sin \hat{B} = \frac{10\sqrt{2}}{\psi_0} \Rightarrow \hat{B} = 45^\circ$$

$$180 - 45 = 135 \Rightarrow \hat{C} = \frac{135\pi}{180}$$

$$\frac{-\tan(\alpha) + \sqrt{\tan(\alpha)}}{-\tan(\alpha) - \tan(\alpha)} = \frac{\sqrt{\tan(\alpha)}}{-\tan(\alpha)} \quad \text{--- 1}$$

$$\frac{\pi}{14} = 14^\circ \Rightarrow A_2 = \frac{r \tan(\frac{\pi}{r} - 14^\circ) + \tan(\frac{\pi}{r} + 14^\circ)}{r \tan(\pi - 14^\circ) - \tan(\frac{r\pi}{r} - 14^\circ)} = \frac{r \cot(14^\circ) - \cot(14^\circ)}{-r \tan(14^\circ) - \cot(14^\circ)}$$

$$\tan \frac{\pi}{14} = x$$

$$\cot \in \frac{\pi}{14} = \frac{1}{x}$$

$$= \frac{1}{\alpha} \quad \checkmark$$

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

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

$$\frac{5 \sin^2 x - 4 \cos^2 x + 1}{\sin^2 x + 4 \cos^2 x - 1} \stackrel{z \text{ f. } \frac{1}{\cos^2 x}}{=} \frac{\tan^2 x - 4 + \frac{1}{\cos^2 x}}{\tan^2 x + 4 - \frac{1}{\cos^2 x}} \stackrel{\rightarrow 1 + \tan^2 x}{=} \frac{1 + \tan^2 x - 1}{1 - \tan^2 x} = \frac{\tan^2 x}{1 - \tan^2 x}$$

ان) $\cos^2 \alpha = \frac{1 + \cos 2\alpha}{2} \rightarrow \cos^2 = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{1 + \sqrt{r}}{r} = \cos^2(r_{1/2})$

$$= \frac{1}{r} \sin^2 \alpha \cdot \frac{1 - \cos \alpha}{r} = \frac{1 + \sqrt{r}}{r}$$

$\sin 45^\circ = \frac{1}{\sqrt{2 + \sqrt{2}}}$
 GGE

$$\left(\cos 45^\circ \right) \frac{\sqrt{1+\mu}}{\mu}$$

$$\cos \beta = \sin \alpha \quad \text{--- point } \overline{U} \text{ is } \star$$