

$$\omega) 27^\circ = (n) \text{ rad}$$

$$\text{ب) } 15^\circ = (n) \text{ rad}$$

(1)

$$n = 27 \times \frac{\pi}{180} = \frac{3\pi}{20}$$

$$n = 15 \times \frac{\pi}{180} = \frac{\pi}{12}$$

$$\omega) \frac{5\pi}{12} \text{ rad} = (n)^\circ$$

$$n = \frac{5\pi}{12} \times \frac{180}{\pi} = \frac{5 \times 180}{12} = 5 \times 15 = 75 \Rightarrow n = 75$$

$$\Rightarrow) \frac{3\pi}{4} \text{ rad} = (n)^\circ$$

$$n = \frac{3\pi}{4} \times \frac{180}{\pi} = \frac{3 \times 180}{4} \Rightarrow 3 \times 45 = 135 \Rightarrow n = 135$$

L 100

(2)

$$\frac{12.5a}{9} \rightarrow \frac{12.5a}{9} \times \frac{9}{10} = \frac{12.5a}{10} = 1.25a$$

$$\frac{a\pi}{1} \text{ Rad} \rightarrow \frac{a\pi}{1} \times \frac{180}{\pi} = \frac{180a}{1} = \frac{50a}{1} = 250a$$

$$(100a) + (1.25a) + (250a) = 180 \Rightarrow a = \frac{180}{350} \Rightarrow a = \frac{18}{35} \Rightarrow 20^\circ, 50^\circ, 110^\circ$$

(3)

$$\omega) \left(\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{2} \right) - \left(\frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{2}} \right) = 1$$

$$\text{ب) } \frac{\left(\frac{\sqrt{2}}{2} \right)^2 + (1)^2 + \left(\frac{\sqrt{2}}{2} \right)^2}{\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}} = \frac{\frac{2}{4} + \frac{4}{4} + \frac{2}{4}}{\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}} = \frac{\frac{8}{4}}{0} = \frac{2}{0}$$

$$= \frac{1}{\frac{\sqrt{2}}{2}} = \frac{1}{\frac{\sqrt{2}}{2}} \times \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

(4)

$$-\sin 30^\circ \cdot \cos 40^\circ + \cos 30^\circ \cdot \sin 40^\circ = \sin^r \theta \Rightarrow \tan \theta = ?$$

$$\left(-\frac{1}{2} \times \frac{1}{2} \right) + \left(\frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} \right) = \sin^r \theta$$

$$\theta \approx 90^\circ \quad -\frac{1}{4} + \frac{\sqrt{6}}{4} = \sin^r \theta \Rightarrow \frac{\sqrt{6}-1}{4} = \sin^r \theta \Rightarrow \sin^r \theta = \frac{\sqrt{6}-1}{4}$$

$$\Rightarrow \sin \theta = \pm \sqrt{\frac{\sqrt{6}-1}{4}} \Rightarrow \sin \theta = \frac{\sqrt{6}-1}{4} \Rightarrow \theta = 20^\circ \Rightarrow \tan 20^\circ = 1$$

$$\frac{r \tan 40^\circ (1 - \tan^2 40^\circ)}{(1 - \cot^2 40^\circ)} = \tan \theta = \theta \text{ rad} \quad \text{---} \quad \textcircled{3}$$

$0 < \theta < 90^\circ$

$$\Rightarrow \frac{\left(\frac{\sqrt{c}}{r}\right) \times \left(1 - \left(\frac{\sqrt{c}}{r}\right)^2\right)}{\left(1 - \left(\frac{\sqrt{c}}{r}\right)^2\right)} = \frac{\frac{\sqrt{c}}{r} \times \frac{r}{r}}{\frac{r}{r}} = \frac{\sqrt{c}}{r} = \sqrt{r}$$

$$\Rightarrow \tan \theta = \sqrt{c} \Rightarrow \theta = 40^\circ \Rightarrow 40^\circ \times \frac{\pi}{180} = \frac{\pi}{9} \text{ rad}$$

$$\tan \theta = 2 \quad \text{---} \quad \textcircled{4}$$

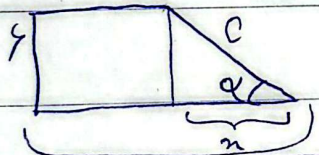
$$\frac{r \sin \theta - \cos \theta}{\sin \theta - 2 \cos \theta} = \frac{\frac{r \sin \theta}{\cos \theta} - \frac{\cos \theta}{\cos \theta}}{\frac{\sin \theta}{\cos \theta} - 2 \frac{\cos \theta}{\cos \theta}} = \frac{r \left(\frac{\sin \theta}{\cos \theta}\right) - 1}{\left(\frac{\sin \theta}{\cos \theta}\right) - 2}$$

$$\Rightarrow \tan \theta = 2 \Rightarrow \frac{r \times 2 - 1}{2 - 2} = 12$$

$$\sin \alpha = \frac{4}{10}$$

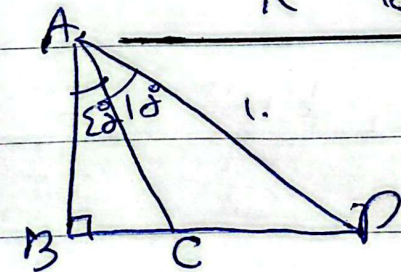
$$\frac{r}{1} = \frac{p}{a}$$

$$\sin \alpha = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{4}{c} \Rightarrow rc = r_0 \Rightarrow c = 10$$



$$\Rightarrow = \sqrt{\frac{14}{10}} = \frac{2}{5} \Rightarrow n = \frac{2}{5} \times 40^\circ = 16^\circ$$

$$\Rightarrow \sqrt{14} + \sqrt{10} = 10 \Rightarrow P = \sqrt{14} + \sqrt{10} + 10 = 14.1$$



$$\angle BAP = 50^\circ + 10^\circ = 40^\circ \quad \text{---} \quad \textcircled{1}$$

$$\cos 40^\circ = \frac{AB}{AD} \Rightarrow AB = a$$

$$\sin 40^\circ = \frac{BD}{AD} \Rightarrow BD = a \sqrt{c}$$

$$\angle BAC = 50^\circ \Rightarrow \tan 50^\circ = \frac{BC}{AB} \Rightarrow BC = a$$

$$\Rightarrow BD = BC + PC \Rightarrow a \sqrt{c} = a + PC \Rightarrow PC = a \sqrt{c} - a$$

ا) $\theta \uparrow \Rightarrow \sin \theta \downarrow, \cos \theta \uparrow \quad 44^\circ < \theta < 45^\circ$

ب) $\theta \uparrow \Rightarrow \sin \theta \downarrow, \cos \theta \uparrow \quad 9^\circ < \theta < 11^\circ$

$$\tan \alpha = \frac{1}{2}$$

$$\sin \alpha = ?$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow 1 + \left(\frac{1}{2}\right)^2 = \frac{1}{\cos^2 \alpha}$$

$$\Rightarrow \frac{1}{4} = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{1}{\cos \alpha} = \frac{\sqrt{5}}{2} \Rightarrow \cos \alpha = \frac{2}{\sqrt{5}}$$

$$\Rightarrow \frac{\sin \alpha}{\cos \alpha} = \tan \alpha \Rightarrow \sin \alpha = \tan \alpha \cdot \cos \alpha$$

$$\Rightarrow \sin \alpha = \left(\frac{1}{2}\right) \times \left(\frac{2}{\sqrt{5}}\right) \Rightarrow \sin \alpha = \frac{1}{\sqrt{5}}$$

$$\Rightarrow \sin \alpha = \frac{\sqrt{5}}{5}$$