

$$\frac{D'}{110} = \frac{Rad}{\pi}$$

الف) $2V = (\pi) rad$ $\frac{2V}{110} = \frac{rad}{\pi} \rightarrow rad = \frac{2V \times \pi}{110}$ 1

$$\rightarrow \pi = \frac{3 \pi}{40}$$

ب) $12\omega = (\pi) rad$

$$\frac{12\omega}{110} = \frac{(\pi)}{\pi} \rightarrow (\pi) = \frac{12\omega \pi}{110} \rightarrow \pi = \frac{12\omega \pi}{46}$$

ج) $\frac{5\pi}{12} rad = (\pi)^\circ \rightarrow \frac{\pi}{110} = \frac{5\pi}{12} \rightarrow \frac{\pi}{110} = \frac{5}{12} \rightarrow \pi = 50^\circ$

د) $\frac{f\pi}{9} rad = (\pi)^\circ \rightarrow \frac{\pi}{110} = \frac{f\pi}{9} \rightarrow \frac{\pi}{110} = \frac{f}{9} \rightarrow \pi = 110^\circ$

هـ) $\frac{\alpha\pi}{1} rad = (\pi)^\circ \rightarrow \frac{\alpha\pi}{\frac{1}{\pi}} = \frac{\pi}{110} \rightarrow \pi = \frac{110\alpha}{1} \rightarrow \pi = 110\alpha$ 2

و) $\frac{12\omega\alpha}{9} = (\pi)^\circ \rightarrow \frac{\pi}{110} = \frac{12\omega\alpha}{9} \rightarrow \frac{\pi}{110} = \frac{12\omega\alpha}{40 \times 9}$

$$\pi = \frac{110 \times 12\omega\alpha}{40 \times 9} = (12\omega\alpha)$$

ز) $10\alpha^\circ$

$$10\alpha^\circ + 12\omega\alpha^\circ + 12\omega\alpha^\circ = 110$$

$$\rightarrow 4\omega\alpha = 110 \rightarrow \alpha = 4^\circ$$

الف) $\cos 90^\circ \cos 30^\circ - \sin 90^\circ \sin 30^\circ = \tan 45^\circ + 2 \cot 45^\circ$ 3

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

$$\frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4} = 1 + 2 = 3$$

$$1 \quad \rightarrow \frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ}{\cot^2 30^\circ - \cot^2 60^\circ}$$

$$2 \quad \rightarrow \frac{\left(\frac{\sqrt{3}}{3}\right)^2 + 1 + (\sqrt{3})^2}{\sqrt{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{1}{3} + 1 + 3}{\frac{2\sqrt{3}}{3}} = \frac{\frac{13}{3}}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}}$$

$$5 \quad -\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin^2 \theta \quad \text{? } \tan \theta \quad \text{?}$$

$$6 \quad \rightarrow -\frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} = \sin^2 \theta$$

$$* \text{ solving } \sin \theta = \frac{\sqrt{2}}{2} \Rightarrow \theta = 45^\circ \rightarrow \tan \theta = 1$$

$$8 \quad \frac{r \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} = \tan \theta \quad \text{?}$$

$$10 \quad \frac{r \times \left(\frac{\sqrt{3}}{3}\right) \times \left(1 - \frac{1}{3}\right)}{\left(1 - \frac{1}{3}\right)^2} = \frac{\frac{r\sqrt{3}}{3}}{\frac{4}{9}} = \frac{3r\sqrt{3}}{4} \rightarrow \theta = 60^\circ$$

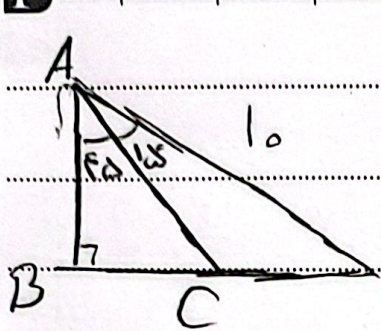
$$12 \quad \frac{r_0}{1\lambda_0} = \frac{r_1}{\lambda_1} \rightarrow r_1 = \frac{\lambda_1 r_0}{\lambda_0}$$

$$14 \quad \tan \theta = \omega \rightarrow \frac{\sin \theta}{\cos \theta} = \omega \rightarrow \sin \theta = \omega \cos \theta \quad \text{?}$$

$$16 \quad \frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} \cdot \frac{\sin \theta = \omega \cos \theta}{\omega \cos \theta - \cos \theta} = \frac{1 \cos \theta}{\cos \theta} = 1$$

$$18 \quad \sin \alpha = \frac{r}{1} = \frac{AC}{AB} \rightarrow AB = 1 \quad \text{?}$$

$$20 \quad 1 + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} = 1 + 4\sqrt{3}$$



$$\hat{A} = 45^\circ \quad \sin 45^\circ = \frac{\sqrt{2}}{2} = \frac{BD}{10}$$

$$\rightarrow BD = 5\sqrt{2}$$

$$\cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{AB}{10} \rightarrow AB = 5\sqrt{2}$$

$$\hat{A}_1 = 45^\circ$$

$$\cot 45^\circ = 1 = \frac{AB}{BC} \rightarrow BC = 5$$

$$DC = BD - BC \rightarrow 5\sqrt{2} - 5 = 5(\sqrt{2} - 1)$$

الف (9) $\left\{ \begin{array}{l} \text{كاهش Sin} \leftarrow \text{ناميه : } 2 \text{ و } 3 \\ \text{انزايش Cos} \leftarrow \text{ناميه : } 1 \end{array} \right\}$

ب (10) $\left\{ \begin{array}{l} \text{كاهش Sin} \leftarrow \text{ناميه : } 2 \text{ و } 3 \\ \text{كاهش Sin} \leftarrow \text{ناميه : } 1 \end{array} \right\}$

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

$$\tan x = \frac{1}{3} \quad \text{3 ضايعه } x$$

$$\frac{1}{9} + 1 = \frac{1}{\cos^2 x} \rightarrow \cos^2 x = 0.9 \quad \text{3 ضايعه } x \quad \cos x = -\frac{3}{\sqrt{10}}$$

$$\tan x = \frac{1}{3} = \frac{\sin x}{\cos x} \rightarrow \sin x = \frac{1}{3} \rightarrow \sin x = \frac{-1}{\sqrt{10}} = \boxed{\frac{-\sqrt{10}}{10}}$$