

$$\text{الف) } \frac{r}{1\lambda_0} = \frac{R\alpha d}{\pi} \rightarrow r \times \frac{\pi}{1\lambda_0} = \frac{r \pi}{\lambda_0}$$

$$\frac{D}{1\lambda_0} = \frac{G}{\lambda_{00}} = \frac{R\alpha d}{\pi}$$

①

$$\text{ب) } \frac{12\lambda}{1\lambda_0} = \frac{R\alpha d}{\pi} \rightarrow \frac{12\lambda}{\lambda_0} \times \frac{\pi}{1\lambda_0} = \frac{12\lambda \pi}{\lambda_0^2}$$

$$\text{ج) } \frac{D}{1\lambda_0} = \frac{\frac{\Delta \pi}{12}}{\pi} \rightarrow \frac{\Delta \pi}{12} \times \frac{1\lambda}{1\lambda_0} \times \frac{1}{\pi} = \frac{\Delta \lambda}{12}$$

$$\text{د) } \frac{D}{1\lambda_0} = \frac{\frac{\pi}{9}}{\pi} \rightarrow \frac{\pi}{9} \times \frac{1\lambda_0}{1\lambda_0} \times \frac{1}{\pi} = \frac{1\lambda_0}{9}$$

② ✓

$$\frac{12\lambda a}{9} = \frac{D}{1\lambda_0} \rightarrow \frac{12\lambda}{9} a \times \frac{1\lambda_0}{1\lambda_0} \times \frac{1}{\lambda_{00}} = 12\lambda a$$

③

$$\frac{D}{1\lambda_0} = \frac{\frac{\alpha \pi}{\lambda}}{\pi} \rightarrow \frac{\alpha \pi}{\lambda} \times \frac{1\lambda_0}{1\lambda_0} \times \frac{1}{\pi} = \frac{\alpha}{\lambda} \quad \text{④ ✓}$$

$$12\lambda a + 12\lambda a + 10a = 1\lambda_0 \Rightarrow 24\lambda a = 1\lambda_0 \Rightarrow a = \frac{1\lambda_0}{24}$$

⑤

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

$$\text{ب) } \frac{\left(\frac{1}{\sqrt{2}}\right)^2 + (1)^2 + (\sqrt{2})^2}{\sqrt{2} - \frac{1}{\sqrt{2}}} = \frac{\frac{1}{2} + 1 + 2}{\frac{\sqrt{2}-1}{\sqrt{2}}} = \frac{\frac{5}{2}}{\frac{\sqrt{2}-1}{\sqrt{2}}} = \frac{5}{2} \times \frac{\sqrt{2}}{\sqrt{2}-1} = \frac{5\sqrt{2}}{2}$$

⑥ ✓

$$-\sin 30^\circ \cos 40^\circ + \cos 30^\circ \sin 40^\circ = \sin^2 \theta$$

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

$$\sin^2 \theta = \frac{1}{2} \Rightarrow \sin \theta = \frac{1}{\sqrt{2}}$$

$$\theta = 45^\circ \Rightarrow \tan \theta = 1$$

⑦ ✓

④

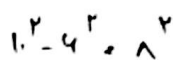
$$\cot \theta_0 = \frac{\cos \theta_0}{\sin \theta_0} = \frac{\frac{1}{v}}{\frac{\sqrt{\mu}}{v}} = \frac{1}{\sqrt{\mu}}$$

$$\Rightarrow \tan \theta = \sqrt{1} \Rightarrow \theta = 45^\circ$$

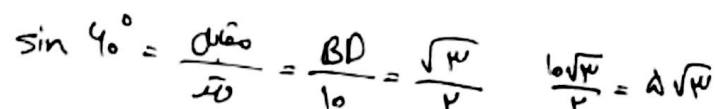
$$\frac{1}{r} \cdot \frac{90^\circ}{180^\circ} = \frac{\text{Rad}}{\pi} \Rightarrow \text{Rad} = \frac{\pi}{r} \quad \leftarrow \left(\frac{D}{180} = \frac{\text{Rad}}{\pi} \right)$$

9

② ✓



⑤



$$AB \Rightarrow 10^2 - (\Delta \sqrt{2})^2 = 100 - 4\Delta = 2\Delta \Rightarrow AB = \Delta$$

$$\tan \phi_d = \frac{\text{دفع}}{\text{مقاومت}} = \frac{BC}{d} = 1 \Rightarrow BC = d$$

باحقن مسامحك الساقين است

$$1) CD = 5\sqrt{5} - 5 = 11,44$$

Q ✓

9

الف بافتدای زاویه θ مقدار $\sin \theta$ و مقدار $\cos \theta$ افتدای یابید

~~مقدار~~ ~~مقدار~~
~~مقدار~~ ~~مقدار~~



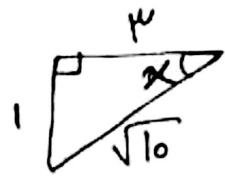
ب بافتدای زاویه θ مقدار $\sin \theta$ و مقدار $\cos \theta$ افتدای یابید

ال $\leftarrow$ ۲



۲ ✓

10



$$1^2 + 3^2 = 1 + 9 = 10 \rightarrow \sqrt{10}$$

$\sin \alpha < 0 \leftarrow$ ~~مقدار~~

$$\sin \alpha = \frac{\text{مقابل}}{\text{مقدار}} = -\frac{1}{\sqrt{10}}$$

۲ ✓