

$$\text{الف) } \frac{D}{1\lambda_0} = \frac{Rad}{\pi} \rightarrow \frac{rV}{1\lambda_0} = \frac{Rad}{\pi} \rightarrow Rad = \frac{r\pi}{V_0}$$

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- ۱

$$\text{ب) } \frac{r\lambda_a}{1\lambda_0} = \frac{Rad}{\pi} \rightarrow Rad = \frac{r\lambda_a \pi}{r\lambda}$$

۲) ✓

$$\text{ج) } \frac{d\pi}{1r} Rad \quad \frac{D}{1\lambda_0} = \frac{\frac{d\pi}{1r}}{\frac{\pi}{1}} \rightarrow D = \frac{d \times 1\lambda_0}{1r} = Vd$$

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

- ۲

$$\frac{\frac{r\lambda_a a}{1}}{\frac{r_0}{1}} = \frac{D}{1\lambda_0} \rightarrow \frac{r\lambda_a a}{1\lambda_0} = \frac{D}{1\lambda_0} \rightarrow D = r\lambda_a a$$

۳) ✓

$$\frac{\frac{a\pi}{1}}{\frac{\pi}{1}} = \frac{D}{1\lambda_0} \rightarrow D = r\lambda_a a \quad r\lambda_a a + r\lambda_a a + 1\lambda_a = 1\lambda_0$$

$$a \left(\frac{r\lambda_a}{f_a} + \frac{r\lambda_a}{f_a} + 1 \right) = 1\lambda_0 \quad a = \frac{1\lambda_0}{f_a} = f_a^0$$

- ۳

$$\text{الف) } \frac{1}{r} \times \frac{\sqrt{r}}{r} = \frac{\sqrt{r}}{r} \times \frac{1}{r} = 1 + r = 1$$

$$\text{ب) } \frac{\left(\frac{1}{\sqrt{r}}\right)^2 + r + (\sqrt{r})^2}{r - \left(\frac{1}{\sqrt{r}}\right)} = \frac{\frac{1}{r}}{\frac{r}{\sqrt{r}}} = \frac{1\sqrt{r}}{r} \quad ۴) ✓$$

$$- \frac{1}{r} \times \frac{1}{r} + \frac{\sqrt{r}}{r} \times \frac{\sqrt{r}}{r} = \sin^2 \theta$$

- ۴

$$- \frac{1}{r} + \frac{r}{r} = \frac{r}{r} \rightarrow \sin \theta = \pm \frac{\sqrt{r}}{r} \rightarrow + \frac{\sqrt{r}}{r}$$

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$$\theta = f_a^0 \quad \tan f_a = \frac{\frac{\sqrt{r}}{r}}{\frac{\sqrt{r}}{r}} = 1 \quad ۵) ✓$$

- ۵

$$r \left(\frac{1}{\sqrt{r}} \right) \left(1 - \left(\frac{1}{\sqrt{r}} \right)^2 \right) = \sqrt{r} \tan \theta \rightarrow \theta = \frac{\pi}{4} = f_a^0$$

$$\theta = \frac{\pi}{r} Rad$$

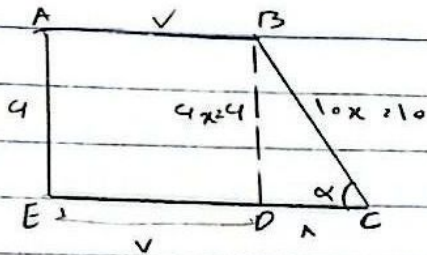
۶) ✓

$$\frac{\sin \theta}{\cos \theta} = \frac{a}{d} \rightarrow \sin \theta = d \cos \theta$$

-4

$$\frac{r(d \cos \theta) - \cos \theta}{d \cos \theta - f \cos \theta} = \frac{1 f \cos \theta}{\cos \theta} = 1 f$$

(P) ✓



$$\frac{BD}{BC} = \frac{4}{10} \rightarrow BC = 10$$

$$DC = \sqrt{10^2 - 4^2} = \sqrt{84} = 10$$

$$P = 4 + 4 + 10 + 4 + 1 = 23$$

(P) ✓

$$\hat{A} = 40^\circ \quad \frac{BP}{AP} = \frac{\sqrt{r}}{r} \rightarrow BP = d\sqrt{r}$$

-1

$$\frac{AB}{AP} = \frac{1}{r} \rightarrow AB = a$$

$$\hat{A} = \hat{C} = 40^\circ \rightarrow AB = BC = a$$

$$DC = d\sqrt{r} - a$$

(P) ✓

$$\cos \theta = \frac{r}{d} \rightarrow \frac{r}{d} = \cos \theta \rightarrow r = d \cos \theta$$

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(P) ✓

$$\sin \theta = \frac{r}{d} \rightarrow \frac{r}{d} = \sin \theta \rightarrow r = d \sin \theta$$

$$1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \rightarrow 1 + \frac{1}{9} = \frac{1}{\cos^2 \theta} \rightarrow \cos^2 \theta = \frac{9}{10}$$

-10

$$\sin^2 \theta + \cos^2 \theta = 1 \rightarrow \sin^2 \theta = 1 - \cos^2 \theta \rightarrow \sin \theta = \sqrt{1 - \cos^2 \theta}$$

(P) ✓

$$\sin \theta = \sqrt{1 - \frac{9}{10}} = \frac{1}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{\sqrt{10}}{10}$$