

$$\frac{D}{N_0} = \frac{Rad}{\pi}$$

$$a) Rad = D \times \frac{\pi}{N_0} \rightarrow 4 \times \frac{\pi}{N_0} = \frac{4\pi}{N_0}$$

$$b) Rad = 10 \times \frac{\pi}{N_0} = \frac{10\pi}{N_0}$$

$$c) \frac{D}{N_0} = \frac{10\pi}{N_0} \rightarrow \frac{10\pi}{N_0} = \frac{10\pi}{N_0} \cdot \frac{10}{10} = 100^\circ$$

$$d) \frac{D}{N_0} = \frac{4\pi}{N_0} \rightarrow \frac{4\pi}{N_0} = \frac{4\pi}{N_0} \cdot \frac{10}{10} = 40^\circ$$

$$\frac{1000}{9} \cdot G \quad \frac{D}{N_0} = \frac{G}{r_0} \rightarrow \frac{D}{N_0} = \frac{1000}{9} \rightarrow \frac{1000}{9} \times \frac{10}{10} = \frac{1000}{9}$$

$$\frac{D}{N_0} = \frac{Rad}{\pi}$$

(2)

$$\frac{1000}{10} + \frac{400}{9} + 100 = 110$$

$$\frac{D}{N_0} = \frac{a\pi}{n} \rightarrow \frac{a\pi}{n} \times \frac{10}{10} = \frac{400}{9}$$

$$\frac{1000}{10} + \frac{400}{9} + \frac{100}{10} = 110$$

$$\frac{400}{9} = 110 \rightarrow a = 40^\circ$$

$$f) \cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + \cot 45^\circ \rightarrow \left(\frac{1}{2} \times \frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{3}}{2} \times \frac{1}{2}\right) - 1 + 1 = 1$$

(3)

$$b) \frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ}{\cot^2 30^\circ - \cot^2 60^\circ} \rightarrow \frac{\left(\frac{\sqrt{3}}{3}\right)^2 + 1^2 + (\sqrt{3})^2}{\frac{9}{\sqrt{3}} - \frac{\sqrt{3}}{3}} \rightarrow \frac{\frac{4}{3} + 1 + 3}{\frac{9\sqrt{3}}{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{8}{3}}{\frac{8\sqrt{3}}{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$- \sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin^2 \theta$$

$$\left(-\frac{1}{2} \times \frac{1}{2}\right) + \left(\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}\right) = \sin^2 \theta \rightarrow -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} = \sin^2 \theta \rightarrow \sin \theta = \frac{\sqrt{2}}{2} \rightarrow \theta = 45^\circ$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\frac{2 \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} = \tan \theta \rightarrow \frac{\frac{2}{\sqrt{3}} (1 - \frac{1}{3})}{(1 - \frac{9}{1})^2} \rightarrow \frac{\frac{2}{\sqrt{3}} \times \frac{2}{3}}{\frac{64}{1}} = \frac{\frac{4}{3\sqrt{3}}}{64} = \frac{1}{16\sqrt{3}} = \tan \theta$$

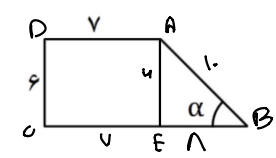
(4)

$$\tan \theta = \sqrt{3} \rightarrow \tan 60^\circ \rightarrow \theta = 60^\circ \rightarrow \frac{D}{N_0} = \frac{Rad}{\pi} \rightarrow \frac{4}{N_0} = \frac{Rad}{\pi} \rightarrow \frac{4 \cdot \pi}{N_0} = Rad \rightarrow \frac{\pi}{4} = Rad$$

$$\frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} \rightarrow \frac{r(a) - 1}{a - r(1)} = \frac{1}{1} = 1$$

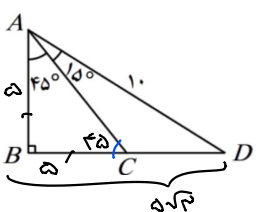
(5)

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{1}{2} \rightarrow \frac{\cos \theta}{\sin \theta} = \frac{1}{2}$$



$$\sin \alpha = \frac{4}{5} \rightarrow \frac{AB}{AC} \rightarrow 4 = AB \cdot \frac{4}{5} \rightarrow AB = 5$$

(6)



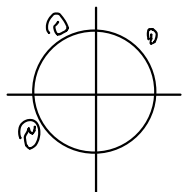
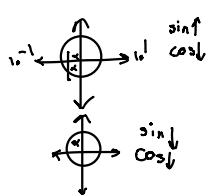
$$\cos A = \cos 45^\circ = \frac{AB}{AC} \rightarrow \frac{1}{\sqrt{2}} = \frac{AB}{2\sqrt{2}} \rightarrow AB = 2$$

(9)

الف) نامبر

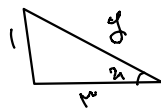
ب) نامبر

(10)



$$\begin{aligned} \sin < 0 \\ \cos < 0 \\ \tan > 0 \end{aligned}$$

$$\tan \theta = \frac{\sin}{\cos}$$



$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sin \theta = \frac{1}{\sqrt{10}} \Rightarrow \sin \theta = \frac{1}{\sqrt{10}}$$