

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

ب) $Rad = D \times \frac{\pi}{N} \rightarrow 4 \times \frac{\pi}{N} = \frac{4\pi}{N}$

ج) $Rad = 10 \times \frac{\pi}{N} = \frac{10\pi}{N}$

د) $\frac{D}{N} = \frac{10\pi}{N} \rightarrow \frac{4\pi}{N} = \frac{10\pi}{N}$

هـ) $\frac{D}{N} = \frac{4\pi}{N} \rightarrow \frac{4\pi}{N} = \frac{4\pi}{N}$

1. $\frac{D}{N} = \frac{G}{r} \rightarrow \frac{D}{N} = \frac{1000}{r} \rightarrow \frac{1000}{r} = \frac{1000}{r}$

$\frac{1000}{10} + \frac{400}{r} + 100 = 100$

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

$\frac{400}{r} = 100 \rightarrow r = 4$

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

$\frac{D}{N} = \frac{4\pi}{N} \rightarrow \frac{4\pi}{N} = \frac{4\pi}{N}$

الف) $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + \cot 45^\circ \rightarrow \left(\frac{1}{2} \times \frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{3}}{2} \times \frac{1}{2}\right) - 1 + 1 = 0$

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

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

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

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

د) $\frac{r \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} = \tan \theta \rightarrow \frac{\frac{r\sqrt{3}}{3} (1 - \frac{1}{3})}{(1 - \frac{9}{r})^2} \rightarrow \frac{\frac{r\sqrt{3}}{3} \times \frac{2}{3}}{\frac{r^2}{9}} = \left(\frac{\frac{2r\sqrt{3}}{9}}{\frac{r^2}{9}}\right) = \frac{2\sqrt{3}}{r} = \tan \theta$

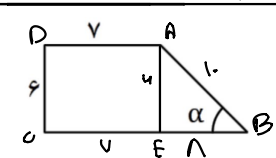
$\tan \theta = \sqrt{3} \rightarrow \tan 60^\circ$

$\theta = 60^\circ \rightarrow \frac{D}{N} = \frac{Rad}{\pi} \rightarrow \frac{4}{N} = \frac{Rad}{\pi} \rightarrow \frac{4\pi}{N} = Rad \rightarrow \frac{\pi}{4} = Rad$

هـ) $\frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} \rightarrow \frac{r(2) - 1}{2 - r(1)} = \frac{1}{1} = 1$

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

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

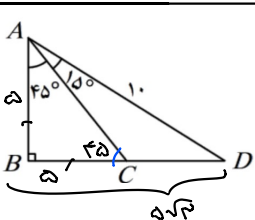


$\sin \alpha = \frac{4}{10} \rightarrow \frac{AB}{AC} = \frac{4}{10} \rightarrow 4 = AB \times \frac{4}{10} \rightarrow AB = 10$

$AE^2 + EB^2 = AB^2 \rightarrow 4^2 + EB^2 = 10^2$

$EB^2 = 10^2 - 4^2 \rightarrow EB = 8$

$AB = 4 + 4 + 8 + 10 = 26$



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

$AD^2 + BD^2 = 10^2$

$BD^2 = 10^2 - 2^2 \rightarrow BD = 2\sqrt{2}$

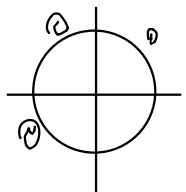
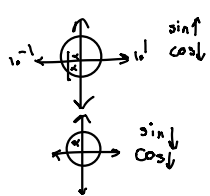
$CD = 2\sqrt{2} - 2$

(9)

الف) نامبر

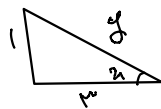
ب) نامبر

(10)



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

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



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

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