

18, 18

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$$1) \angle V^\circ = (2) \text{ rad} \rightarrow \frac{D}{180} = \frac{\text{Rad}}{\pi} = \frac{2}{\pi} = \frac{\text{Rad}}{\pi} \quad \angle V \pi = 180 \cdot \text{Rad} = \angle V = \frac{180 \cdot \text{Rad}}{\pi}$$

$$\text{Rad} = \frac{\angle V \pi}{180} = \frac{2\pi}{180} \checkmark$$

(2)

$$2) \angle \omega^\circ = (3) \text{ rad} \rightarrow \frac{D}{180} = \frac{\text{Rad}}{\pi} = \frac{3}{\pi} = \frac{\text{Rad}}{\pi} = \frac{3\pi}{180} = \frac{\angle \omega \pi}{180} \checkmark$$

$$3) \frac{5\pi}{12} \text{ Rad} = (2)^\circ \quad \frac{\pi}{4} \times 2^\circ \rightarrow \frac{\pi}{2} = 2^\circ \quad 2 \times 12 = 24^\circ \checkmark$$

$$4) \frac{4\pi}{9} = (2)^\circ \quad \frac{\pi}{4} = 4^\circ \rightarrow \frac{\pi}{2} = 4^\circ \quad 4 \times 9 = 36^\circ \checkmark$$

$$\text{10a} \rightarrow \frac{12a}{9} G, \frac{a\pi}{1} \text{ Rad} \quad \frac{G}{180} \times \frac{12a}{9} = \frac{D}{180} \quad \frac{12a}{180} = \frac{D}{180} = 12, 12a^\circ \checkmark$$

$$10a^\circ + \frac{12a}{9} G + \frac{a\pi}{1} \text{ Rad} = 180^\circ$$

$$\frac{a\pi}{180} \text{ Rad} = \frac{D}{180} \quad \frac{a\pi}{180} = \frac{D}{180} \quad \frac{12a}{9} = 12, 12a^\circ \checkmark$$

$$10a^\circ + 12, 12a^\circ + 12, 12a^\circ = 180^\circ \rightarrow 12, 12a^\circ = 180^\circ \rightarrow a = \frac{180^\circ}{12} = 15^\circ \quad a = 15^\circ \checkmark$$

$$1) \cos 40^\circ \times \cos 70^\circ - \sin 40^\circ \times \sin 70^\circ - \tan 40^\circ + \cot 40^\circ$$

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

$$2) \frac{\tan 70^\circ + \tan 40^\circ + \tan 10^\circ}{\cot 70^\circ - \cot 40^\circ} = \frac{1}{\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}}$$

$$\tan 70^\circ = \left(\frac{1}{\sqrt{3}}\right)^2 = \frac{1}{3}$$

$$\tan 40^\circ = 1 \quad \cot 70^\circ = \frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}$$

$$= \frac{\frac{1}{3} + 1 + 2}{\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}} = \frac{\frac{12}{3}}{\frac{2}{\sqrt{3}}} = \frac{12\sqrt{3}}{2} \checkmark$$

$$- \sin 70^\circ \times \cos 40^\circ + \cos 70^\circ \times \sin 40^\circ = \sin 70^\circ$$

$$- \frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = \sin 70^\circ = -\frac{1}{2} + \frac{3}{2} = \sin 70^\circ \rightarrow \frac{3}{2} = \sin 70^\circ$$

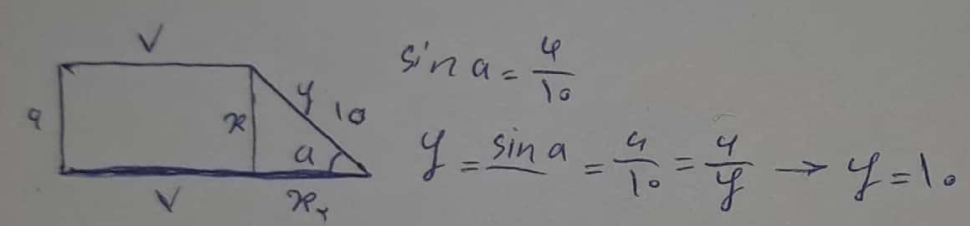
$$\frac{\sqrt{3}}{2} = \sin \theta \quad \frac{\sqrt{3}}{2} = \sin \theta \quad \begin{matrix} 60^\circ, 120^\circ \rightarrow 1 \\ 120^\circ, 240^\circ \rightarrow -1 \end{matrix} \rightarrow \frac{1}{2} \checkmark$$

$$\frac{r \tan 30^\circ (1 - \tan 30^\circ)}{(1 - \cot 30^\circ)^2} = \tan \theta, \theta < 90$$

سوال ۵: ۱, ۷, ۵

$$r \times \frac{1}{\sqrt{r}} \left(1 - \frac{1}{r}\right)^{\tan} = \frac{\frac{r}{\sqrt{r}} \times \frac{r}{r}}{(1 - \frac{1}{r})^{\frac{r}{9}}} = \frac{\frac{1}{\sqrt{r}} \times \frac{r}{r}}{\frac{1}{9}} = \frac{1}{\sqrt{r}} = \tan \theta \rightarrow \theta = \frac{\pi}{\sqrt{r}}$$

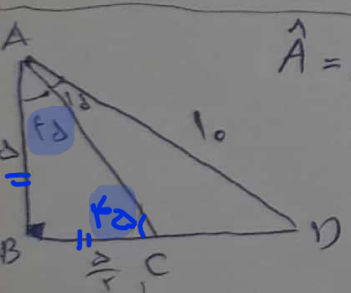
$$\frac{r \sin \theta - \cos \theta}{\sin - r \cos \theta} = \frac{r \sin \theta \times \frac{1}{\sqrt{r}} - \frac{\cos \theta}{\sqrt{r}}}{\frac{\sin}{\sqrt{r}} - r \frac{\cos}{\sqrt{r}}} = \frac{r \times \frac{1}{\sqrt{r}} - \frac{1}{\sqrt{r}}}{\frac{1}{\sqrt{r}} - r \frac{1}{\sqrt{r}}} = 1 \checkmark$$



سوال ۷: ۷

$$x_r = 10^2 - 4^2 = 100 - 16 = 84 \Rightarrow \sqrt{84} = 1$$

$$\rightarrow S_{\square} = 1 + 2 \times V + 10 + 4 = 38 \checkmark$$



$\hat{A} = \hat{A}_1 + \hat{A}_2 = 40^\circ$

$\triangle ABD: AB = \cos 40^\circ = \frac{1}{r} = \frac{AB}{10} \rightarrow AB = \frac{10}{r} = 5 \checkmark$

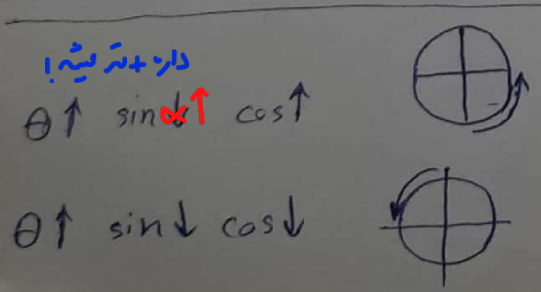
$BD = \sin 40^\circ = \frac{\sqrt{r}}{r} = \frac{BD}{10} \rightarrow DB = \frac{10 \sqrt{r}}{r} = 5\sqrt{r} \checkmark$

$\triangle ABC: AB = \cos 40^\circ = \frac{\sqrt{r}}{r} = \frac{AB}{AC} \rightarrow AC = \frac{AB}{\cos 40^\circ} = \frac{5}{\cos 40^\circ}$

$$r AC = 5\sqrt{r} \rightarrow AC = \frac{5\sqrt{r}}{r}$$

$$BC = \sin 40^\circ = \frac{BC}{\frac{5\sqrt{r}}{r}} = \frac{\sqrt{r}}{r} \rightarrow BC = \frac{\sqrt{r}}{r} \times \frac{5\sqrt{r}}{r} = \frac{5}{r} \checkmark BC = AB = 5$$

$$DC = BD - BC = 5\sqrt{r} - 5$$



سوال ۹: ۱

الف) ۳

ب) ۶

$$\tan \alpha = \frac{1}{3} = \frac{\sin \alpha}{\cos \alpha}$$

فرض

$$\sin^2 \alpha + \cos^2 \alpha = 1 \rightarrow \cancel{10 \times 90} \quad 1\alpha^2 + 9\alpha^2 = 1 \quad 1\alpha + 9\alpha = 1$$

$$\rightarrow \alpha = 9,1 \quad \frac{1}{10} \times 90 = 9^\circ$$

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

فرض $\rightarrow \sin < 0$
 $\cos < 0$

$$\sin \alpha = -\frac{1}{\sqrt{10}} = -\frac{\sqrt{10}}{10} \quad \checkmark$$

سوال ۱۰

(۲)