

کلاس دهم (فصل A)

حل المسائل

1910

بسم الله الرحمن الرحيم

$$\text{الف) } \frac{14^\circ}{11^\circ} = \frac{\text{Rad}}{\pi} \rightarrow \frac{14\pi}{11} = \frac{14\pi}{11}$$

$$\text{ب) } \frac{14^\circ}{11^\circ} = \frac{\text{Rad}}{\pi} \rightarrow \frac{14\pi}{11} = \frac{14\pi}{11}$$

$$\text{ج) } \frac{5\pi}{14} \times \frac{11^\circ}{\pi} = \boxed{40.7^\circ}$$

$$\text{د) } \frac{5\pi}{14} \times \frac{11^\circ}{\pi} = \boxed{40.7^\circ}$$

$$1.0^\circ + 12.0^\circ + 22.0^\circ = 35.0^\circ \rightarrow 35.0^\circ = 11^\circ \rightarrow \boxed{a = 1^\circ}$$

$$\frac{14.0^\circ}{9} = \frac{D}{11^\circ} \rightarrow D = \boxed{17.6^\circ}$$

$$\frac{a\pi}{14} \times \frac{11^\circ}{\pi} = \boxed{22.0^\circ}$$

$$\text{الف) } \left(\frac{1}{2} \times \frac{\sqrt{3}}{2} \right) - \left(\frac{\sqrt{3}}{2} \times \frac{1}{2} \right) - 1 + 2 = \boxed{1}$$

$$\text{ب) } \frac{\left(\frac{\sqrt{3}}{2} \right)^2 + 1 + (\sqrt{3})^2}{\sqrt{3} - \sqrt{3}} = \frac{\frac{3}{4} + 1 + 3}{\frac{2\sqrt{3}}{4}} = \frac{\frac{10}{4}}{\frac{2\sqrt{3}}{4}} = \frac{10}{2\sqrt{3}} = \frac{5\sqrt{3}}{3}$$

LINE NOTE

$$\left(-\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}\right) + \left(\frac{\sqrt{2}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}\right) = -\frac{1}{2} + \frac{2}{2} = \frac{1}{2} = \sin^2 \theta \Rightarrow \sin \theta = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad (15)$$

$$\sin^2 \theta + \cos^2 \theta = 1 \rightarrow \left(\frac{1}{\sqrt{2}}\right)^2 + \cos^2 \theta = 1 \rightarrow \cos^2 \theta = \frac{1}{2} \rightarrow \cos \theta = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\tan \alpha = \frac{\frac{\sqrt{2}}{\sqrt{2}}}{\frac{\sqrt{2}}{\sqrt{2}}} = 1$$

$$\frac{\frac{\sqrt{2}}{\sqrt{2}} \times \frac{1}{\sqrt{2}}}{\left(\frac{1}{\sqrt{2}}\right)^2} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \sqrt{2} = \tan \theta \Rightarrow \theta = 45^\circ \Rightarrow 45^\circ \times \frac{\pi}{180} = \frac{\pi}{4}$$

$$1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \rightarrow 1 + 2 = \frac{1}{\cos^2 \theta} \rightarrow \frac{1}{\cos^2 \theta} = 3 \Rightarrow \cos \theta = \frac{1}{\sqrt{3}}, \sin^2 \theta = 1 - \cos^2 \theta = \frac{2}{3} \Rightarrow \sin \theta = \frac{\sqrt{2}}{\sqrt{3}} \Rightarrow \sin \theta = \frac{\sqrt{6}}{3}$$

$$\frac{2 \times \frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}}{\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}}} = \frac{\frac{2-1}{\sqrt{3}}}{\frac{0}{\sqrt{3}}} = 1$$

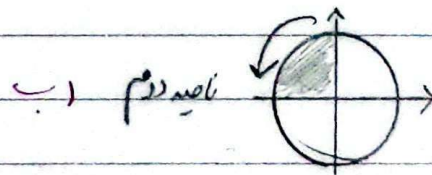
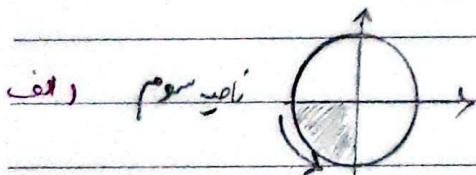
Diagram: A right triangle ABC with right angle at C. Angle A is α . Side AC is 10, side BC is 9. $\sin \alpha = \frac{9}{10} \Rightarrow \frac{9}{10} = \frac{9}{10}$. $\triangle ABC$ is right, $AC^2 + CB^2 = AB^2 \Rightarrow 9^2 + CB^2 = 10^2 \Rightarrow CB = 1$.

$$\Rightarrow \text{side } AB = \sqrt{9^2 + 1^2} = \sqrt{80} = 4\sqrt{5}$$

Diagram: A right triangle ABD with right angle at B. Angle A is α . Side AB is 10, side BD is 10. $\hat{D} = 180^\circ - (10^\circ + 130^\circ) = 40^\circ$. $\frac{10}{\sin 40^\circ} = \frac{AB}{\sin 90^\circ} \Rightarrow AB = 10$.

Diagram: A right triangle ABC with right angle at C. Angle A is α . Side AC is 10, side BC is 10. $\triangle ABC$ is right, $AB = BC = 10$. $BD = \sqrt{2} \times 10 = 10\sqrt{2}$. $CD = BD - BC = 10\sqrt{2} - 10$.

$$\Rightarrow CD = BD - BC = 10\sqrt{2} - 10$$



$$\tan \alpha = \frac{1}{\sqrt{2}} \quad \tan \alpha \times \frac{1}{\cot \alpha} = 1 \Rightarrow \cot \alpha = \sqrt{2} \quad 1 + \cot^2 \alpha = \frac{1}{\sin^2 \alpha} = 1 + 2 = \frac{1}{\sin^2 \alpha} \Rightarrow \sin \alpha = \frac{1}{\sqrt{3}}$$

$$\Rightarrow \sin^2 \alpha = \frac{1}{3} \Rightarrow \sin \alpha = \frac{1}{\sqrt{3}}$$

$$\sin \alpha = \pm \frac{\sqrt{10}}{10} \rightarrow \sin \alpha = -\frac{\sqrt{10}}{10}$$

LINE NOTE