

$$2V^\circ = (2) \text{ rad} \Rightarrow 2V \times \frac{\pi}{180} \text{ rad} = \frac{9\pi}{90} \text{ rad} \quad (1)$$

$$12a^\circ \times \frac{\pi}{180} = \frac{2a\pi}{15} \text{ rad}$$

$$\frac{2a\pi}{15} \times \frac{180}{\pi} = 1a^\circ \quad \frac{2\pi}{9} \times \frac{180}{\pi} = 40^\circ$$

$$10a^\circ + \left(\frac{12a}{9} \times \frac{9}{10} \right) + \left(\frac{2a\pi}{15} \times \frac{180}{\pi} \right) =$$

$$10a + 12a + 24a = 180 \quad a = 5^\circ$$

$$\cos 40^\circ \cos 10^\circ - \sin 40^\circ \sin 10^\circ - \tan 20^\circ + 2 \cot 20^\circ = \quad (2)$$

$$\frac{\sqrt{3}}{4} \times \frac{1}{2} - \frac{\sqrt{3}}{4} \times \frac{1}{2} - 1 + 2 = 1$$

$$\frac{\tan 10^\circ + \tan 20^\circ + \tan 40^\circ}{\cot 10^\circ - \cot 40^\circ} = \frac{\frac{\sqrt{3}}{4} + 1 + 2}{\sqrt{3} - \frac{\sqrt{3}}{4}} = \frac{\frac{12 + \sqrt{3}}{4}}{\frac{3\sqrt{3}}{4}} =$$

$$\frac{12 + \sqrt{3}}{3\sqrt{3}}$$

(3)

$$-\sin 10^\circ \cos 40^\circ + \cos 10^\circ \sin 40^\circ = \sin \theta$$

$$-\frac{1}{4} \times \frac{1}{2} + \frac{\sqrt{3}}{4} \times \frac{\sqrt{3}}{2} = \sin \theta$$

$$-\frac{1}{8} + \frac{3}{8} = \frac{2}{8} = \frac{1}{4} = \sin \theta \rightarrow \sin \theta = \frac{\sqrt{2}}{4} \quad \text{أو } \sin 22.5^\circ$$

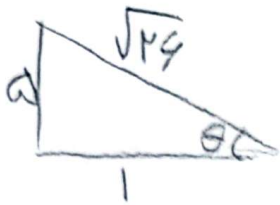
$$2 \tan 10^\circ (1 - \tan^2 10^\circ)$$

$$\frac{2 \tan 10^\circ (1 - \tan^2 10^\circ)}{(1 - \cot^2 40^\circ)^2} = \tan \theta \quad \frac{\frac{2\sqrt{3}}{4} (1 - \frac{1}{4})}{(1 - \frac{1}{3})^2} = \frac{\frac{\sqrt{3}}{2}}{\frac{4}{9}} =$$

$$\sqrt{3} = \tan \theta$$

$$\theta = 60^\circ = \frac{\pi}{3} \text{ rad}$$

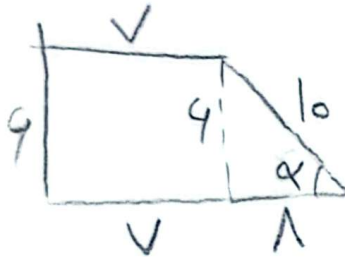
$$\tan \theta = \mu$$



$$\frac{\mu \sin \theta - \cos \theta}{\sin \theta - \epsilon \cos \theta} = \frac{\mu \sin \theta - \cos \theta}{\cos \theta}$$

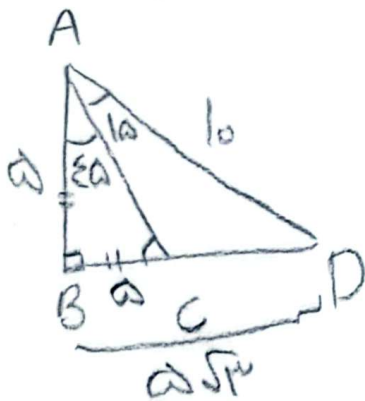
$$\frac{\mu \tan \theta - 1}{\tan \theta - \epsilon} = \frac{1\epsilon}{1} = \frac{\sin \theta - \epsilon \cos \theta}{\cos \theta}$$

(9)



$$\Rightarrow P = \mu A$$

(V)

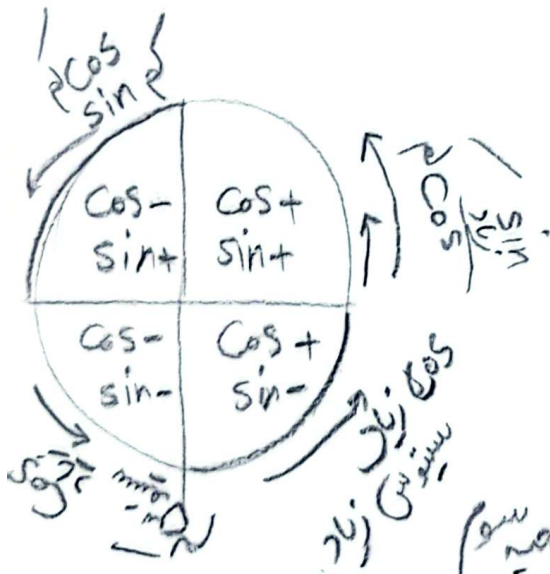


$$\frac{BD}{10} = \sin \epsilon = BD = \frac{\sqrt{10}}{10} \times 10 = a\sqrt{10}$$

$$AB = a$$

$$DC = a\sqrt{10} - a = a(\sqrt{10} - 1)$$

(1)

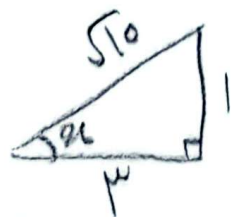


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(9)

$$\tan \alpha = \frac{1}{\mu}$$

(10)



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