

تکلیف شماره 16

کلاس دهم دفتر B

روز شنبه 1398/05/03

$$\frac{D_{ax}}{180} = \frac{R_{ad}}{\pi} \quad R_{ad} = \pi D_{ax} \quad \frac{27\pi}{180} = \frac{3\pi}{20}$$

1- الف)

$$\frac{12\Delta}{180} = \frac{R_{ad}}{\pi} \quad R_{ad} = \frac{12\Delta\pi}{180} \quad \frac{12\Delta\pi}{180} = \frac{2\Delta\pi}{39}$$

ب)

$$\frac{\frac{\Delta\pi}{18}}{\pi} = \frac{x^\circ}{180} \quad x = \frac{18 \times 180}{18} = 180^\circ$$

ج)

$$\frac{\frac{\Sigma\pi}{\pi}}{\pi} = \frac{x^\circ}{180} \quad x = \frac{\Sigma\pi \times 180}{\pi} = 180^\circ$$

د)

$$\frac{G}{200} = \frac{D}{180} = \frac{R_{ad}}{\pi} \quad \frac{12\Delta a}{200} = \frac{x^\circ}{180} \quad x = \frac{180 \times 12\Delta a}{200} = 10.8\Delta a$$

2-

$$\frac{ax}{\pi} = \frac{x^\circ}{180} \quad x^\circ = \frac{180 \times a}{\pi} = 22.1\Delta a \quad 10.8\Delta a + 22.1\Delta a = 180 \quad \Sigma\Delta a = 180$$

$$a = \frac{180}{\Sigma\Delta} = \frac{20}{\Sigma} = 2^\circ$$

$$\frac{\cos 40^\circ \cos 30^\circ - \sin 40^\circ \sin 30^\circ}{\cos 80^\circ} = \frac{\sin 80^\circ}{\sin 80^\circ} = 1$$

3- الف)

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

$$\left(\frac{\sin 30^\circ}{\cos 30^\circ}\right)^2 + \left(\frac{\sin 80^\circ}{\cos 80^\circ}\right)^2 + \left(\frac{\sin 40^\circ}{\cos 40^\circ}\right)^2 \Rightarrow \left(\frac{\sin 30^\circ}{\cos 30^\circ}\right)^2 = \left(\frac{1/2}{\sqrt{3}/2}\right)^2 = \frac{1}{3} \quad \left(\frac{\sin 80^\circ}{\cos 80^\circ}\right)^2 = \left(\frac{\sqrt{3}/2}{1/2}\right)^2 = 3$$

ب)

$$\left(\frac{\sin 40^\circ}{\cos 40^\circ}\right)^2 = \left(\frac{\sqrt{3}/2}{1/2}\right)^2 = 3 \quad \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{1/2}{\sqrt{3}/2} = \frac{1}{\sqrt{3}} \quad \frac{1}{\sqrt{3}} + 1 + 3 = \frac{1}{\sqrt{3}} + 4 = \frac{1 + 4\sqrt{3}}{\sqrt{3}} = \frac{1 + 4\sqrt{3}}{\sqrt{3}}$$

$$-\sin 30^\circ \cos 40^\circ + \cos 30^\circ \sin 40^\circ = \sin \theta \Rightarrow -\frac{1}{2} \times \frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = -\frac{1}{2\sqrt{3}} + \frac{3}{4} = \frac{1}{4} = \sin \theta$$

$$\sin \theta = \frac{\sqrt{3}}{4} \quad (\theta < 90^\circ) \Rightarrow \theta = 80^\circ \quad \tan 80^\circ = \frac{\sin 80^\circ}{\cos 80^\circ} = \frac{\frac{\sqrt{3}}{4}}{\frac{1}{2}} = \frac{\sqrt{3}}{2}$$

2-

$$\tan 40^\circ = \frac{\sin 40^\circ}{\cos 40^\circ} = \frac{1/2}{\sqrt{3}/2} = \frac{1}{\sqrt{3}} \quad \frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}} = \frac{1}{3} \quad \left(\frac{\cos 40^\circ}{\sin 40^\circ}\right)^2 = \left(\frac{1/2}{\sqrt{3}/2}\right)^2 = \frac{1}{3}$$

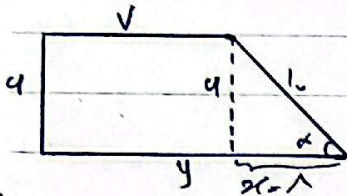
د)

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

$$\tan \theta = 2 \quad 1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \Rightarrow 1 + 2^2 = \frac{1}{\cos^2 \theta} \quad \cos \theta = \frac{1}{\sqrt{5}} \quad -4$$

$$1 + \cot^2 \theta = \frac{1}{\sin^2 \theta} \quad 1 + \frac{1}{2} = \frac{1}{\sin^2 \theta} \quad \sin^2 \theta = \frac{2}{5}$$

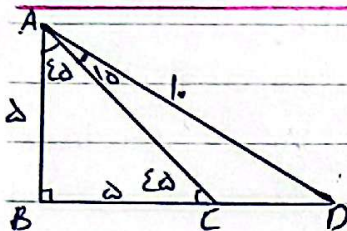
$$\frac{3 \sin \theta - \cos \theta}{\sin \theta - 2 \cos \theta} = \frac{\frac{3}{\sqrt{5}} - \frac{1}{\sqrt{5}}}{\frac{2}{\sqrt{5}} - \frac{2}{\sqrt{5}}} = \frac{\frac{2}{\sqrt{5}}}{\frac{0}{\sqrt{5}}} = \frac{2}{0}$$



$$\sin \alpha = \frac{\text{مقابل}}{\text{وتر}} = \frac{4}{17} \Rightarrow \text{وتر} = 17$$

$$x^2 + 4^2 = 17^2 \quad x^2 + 16 = 289 \quad x^2 = 273 \quad x = 17$$

$$y = x + 4 = 17 + 4 = 21 \Rightarrow P = 17 + 4 + 17 + 21 = 59$$



$$\cos 40^\circ = \frac{1}{\sqrt{5}} = \frac{\text{مجاور}}{\text{وتر}} \Rightarrow \text{مجاور} = \frac{1}{\sqrt{5}} \Rightarrow 2$$

$$BC = 2 \quad 2^2 + BD^2 = 1^2 \quad BD^2 = 1 - 4 = -3 \quad BD = \sqrt{3} = BC + CD = 2 + 1 = 3$$

$$2 + CD = 3 \Rightarrow CD = 1 \Rightarrow \sqrt{5} = 2 + 1 = 3$$

الف) در ناحیه سوم قرار دارد

ب) در ناحیه دوم قرار دارد

ج) در ناحیه اول قرار دارد

$$1 + \tan^2 x = \frac{1}{\cos^2 x} \quad 1 + \frac{1}{4} = \frac{1}{\cos^2 x} \quad \frac{5}{4} = \frac{1}{\cos^2 x} \quad \cos^2 x = \frac{4}{5} \quad \cos x = \frac{2}{\sqrt{5}}$$

$$1 + \cot^2 x = \frac{1}{\sin^2 x} \quad 1 + 4 = \frac{1}{\sin^2 x} \quad \sin^2 x = \frac{1}{5} \quad \sin x = \frac{1}{\sqrt{5}}$$