نگار فتحی — به نام خداوند مهر — تکلیف شماره ۱۶ دهم دختر پنجشنبه

۱۹/۵

۱-

الف) $\frac{27}{180} = \frac{Rad}{\pi} \Rightarrow \frac{27\pi}{180} = \frac{3\pi}{20}$

ب) $\frac{125}{180} = \frac{Rad}{\pi} \Rightarrow \frac{125\pi}{180} = \frac{25\pi}{36}$

ج) $\frac{\frac{5\pi}{12}}{\pi} = \frac{D}{180} \Rightarrow \frac{900}{12} = D = 75^\circ$

د) $\frac{\frac{4\pi}{9}}{\pi} = \frac{D}{180} \Rightarrow \frac{720}{9} = D = 80^\circ$

(۲) ✓

۲-

$\frac{G}{200} = \frac{D}{180} = \frac{Rad}{\pi} \longrightarrow \frac{\frac{12.5a}{9}}{200} = \frac{D}{180} \Rightarrow \frac{5a}{72} = \frac{D}{180}$

$D = 12.5a^\circ$ (۲) ✓

$\frac{\frac{a\pi}{8}}{\pi} = \frac{D}{180} = \frac{180a}{8} \Rightarrow D = 22.5a^\circ$

$22.5a^\circ + 12.5a^\circ + 10a^\circ = 180^\circ \Rightarrow 45a^\circ = 180^\circ \Rightarrow a = \frac{180}{45} = 4$

۳-

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

ب) $\frac{\left(\frac{\sqrt{3}}{3}\right)^2 + 1 + (\sqrt{3})^2}{\frac{3\sqrt{3}}{3} \quad \sqrt{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{1}{3} + 1 + 3}{\frac{2\sqrt{3}}{3}} = \frac{\frac{13}{3}}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}} = \frac{13\sqrt{3}}{6}$

(۲) ✓

۴-

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

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

چون منفی نیست زاویه حاده است (45°)

$\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1 \rightarrow \tan\theta$

(۲) ✓

۵-

$\frac{2\left(\frac{\sqrt{3}}{3}\right)\left(1 - \left(\frac{\sqrt{3}}{3}\right)^2\right)}{\left(1 - \left(\frac{\sqrt{3}}{3}\right)^2\right)^2} = \frac{\left(\frac{2\sqrt{3}}{3}\right)\left(\frac{2}{3}\right)}{\frac{4}{9}} = \frac{\frac{4\sqrt{3}}{9}}{\frac{4}{9}} = \sqrt{3} = \tan\theta$

$\frac{2}{3} \quad \frac{3}{9} \quad \frac{1}{3}$

$\theta = 60^\circ$

$\frac{60}{180} = \frac{Rad}{\pi} = \frac{60\pi}{180} = \frac{\pi}{3}$

(۲) ✓

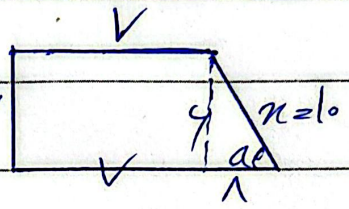
زیبا شد

۶- $\tan\theta = ۵ \Rightarrow \frac{\sin\theta}{\cos\theta} = ۵ \Rightarrow \sin\theta = ۵\cos\theta$ ✓

$\frac{۳(۵\cos\theta) - \cos\theta}{۵\cos\theta - ۴\cos\theta} = \frac{۱۵\cos\theta - \cos\theta}{\cos\theta} = \frac{۱۴\cos\theta}{\cos\theta} = ۱۴$

۷- $\frac{۶}{x} = \frac{۶}{۱۰} \Rightarrow x = ۱۰$ ← وتر مثلث

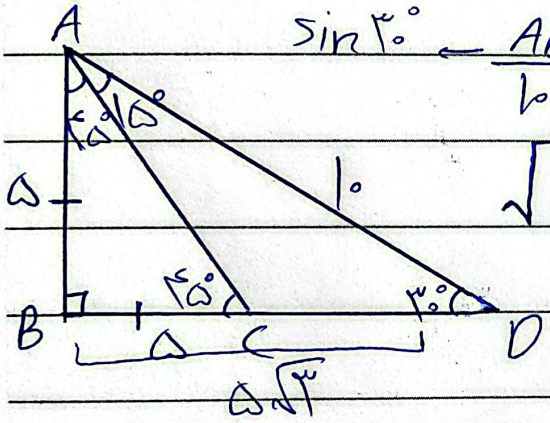
$\sqrt{۱۰۰ - ۳۶} = ۸$



$۱۰ + ۱۵ + ۶ + ۷ = ۳۸$ ✓

۸- $\sin ۳۰^\circ = \frac{AB}{۱۰} = \frac{۱}{۲} \Rightarrow AB = ۵ = BC$ ← ۴۵°

$\sqrt{۱۰۰ - ۲۵} = ۵\sqrt{۳}$ $\quad CD = ۵\sqrt{۳} - ۵$

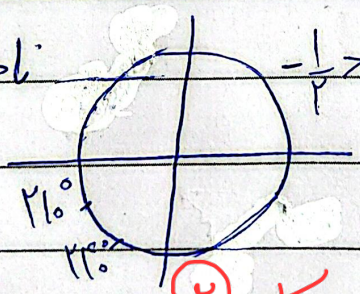


✓

۹- **الف) ناحیه‌ی سوم**

$۲۱۰^\circ : \frac{-\sqrt{۳}}{۲}, \frac{-۱}{۲}$

$۲۴۰^\circ : \frac{-۱}{۲}, \frac{-\sqrt{۳}}{۲}$



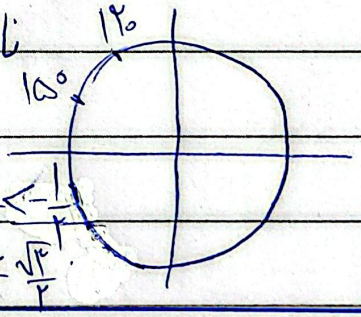
$-\frac{۱}{۲} > -\frac{\sqrt{۳}}{۲}$

✓

ب) ناحیه‌ی دوم

$۱۲۰^\circ : \frac{۱}{۲}, \frac{\sqrt{۳}}{۲}$

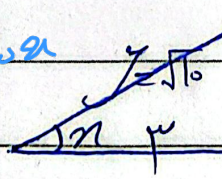
$۱۵۰^\circ : \frac{\sqrt{۳}}{۲}, \frac{۱}{۲}$



$-\frac{\sqrt{۳}}{۲} < -\frac{۱}{۲}$

$\frac{۱}{۲} < \frac{\sqrt{۳}}{۲}$

۱۰- $\tan\alpha = \frac{۱}{۳} \Rightarrow \frac{\sin\alpha}{\cos\alpha} = \frac{۱}{۳}$



$y = \sqrt{(۱)^۲ + (۳)^۲} = \sqrt{۱۰}$ $\quad \frac{۱}{\sqrt{۱۰}} = \frac{\sqrt{۱۰}}{۱۰}$

هر دو ناحیه سوم است، سینوس منفی است

(۱/۵)