نام و نام خانوادگی ...بینا بکتاش... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ...دهم ریاضی B...

۱

الف) $\frac{27}{180} = \frac{R}{\pi} \rightarrow \frac{27\pi}{180} = \boxed{\frac{3\pi}{20}}$

ب) $\frac{125}{180} = \frac{R}{\pi} \rightarrow \frac{125\pi}{180} = \boxed{\frac{25\pi}{36}}$

ج) $\frac{\frac{5\pi}{12}}{\pi} = \frac{D}{180} \rightarrow \frac{\frac{5\pi}{\cancel{12}} \times \cancel{180}^{15}}{\pi} = 75\pi \times \frac{1}{\pi} = \boxed{75^\circ}$

د) $\frac{\frac{4\pi}{9}}{\pi} = \frac{D}{180} \rightarrow \frac{4\cancel{\pi}}{\cancel{9}} \times \cancel{180}^{20} \times \frac{1}{\cancel{\pi}} = \boxed{80^\circ}$

۲

$\frac{\frac{125a}{9}}{200} = \frac{D}{180}$ $\quad \frac{\frac{125a}{\cancel{9}} \times \cancel{180}^{20}}{\cancel{200}_{10}} = 12.5a$

$\frac{\frac{a\pi}{8}}{\pi} = \frac{D}{180}$ $\quad \frac{a\cancel{\pi}}{\cancel{8}_{2}} \times \cancel{180}^{45} \times \frac{1}{\pi} = \frac{45}{2}a = 22.5a$

$22.5a + 12.5a + 10a = 180^\circ$

$45a = 180^\circ$

$\boxed{a = 4}$

۳

الف) $\underbrace{\left(\frac{1}{2} \times \frac{\sqrt{3}}{2}\right)}_{\frac{\sqrt{3}}{4}} - \underbrace{\left(\frac{\sqrt{3}}{2} \times \frac{1}{2}\right)}_{\frac{\sqrt{3}}{4}} - 1 + 2 = \boxed{1}$

$\tan 30^\circ = \frac{1}{2} \times \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} \xrightarrow{\text{به توان } 2} \frac{1}{3}$

$\frac{\sqrt{3}}{2} \times \frac{2}{1} = \sqrt{3} \xrightarrow{\text{به توان } 2} 3$

$\frac{\cos 30^\circ}{\sin 30^\circ} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{2} \times \frac{2}{1} = \sqrt{3}$

$\frac{\cos 60^\circ}{\sin 60^\circ} = \frac{1}{2} \times \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$

ب) $\frac{\frac{1}{3} + 1 + 3}{\sqrt{3} - \frac{1}{\sqrt{3}}} = \frac{\frac{1}{3} + \frac{3}{3} + \frac{9}{3}}{\frac{3}{\sqrt{3}} - \frac{1}{\sqrt{3}}} = \frac{13}{3} \times \frac{\sqrt{3}}{2} = \boxed{\frac{13\sqrt{3}}{6}}$

۴

$\sin 30^\circ = \frac{1}{2}$

$\sin 60^\circ = \frac{\sqrt{3}}{2}$

$\cos 30^\circ = \frac{\sqrt{3}}{2}$

$\cos 60^\circ = \frac{1}{2}$

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

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

$\cos^2\theta + \sin^2\theta = 1$

$\cos^2\theta = 1 - \frac{1}{2} = \frac{1}{2}$

$1 + \tan^2\theta = \frac{1}{\frac{1}{2}}$

$1 + \tan^2\theta = 2$

$\tan^2\theta = 1$

$\boxed{\tan\theta = 1}$

۵

$\tan 30^\circ = \frac{\sin 30^\circ}{\cos 30^\circ} \rightarrow \frac{1}{2} \times \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$

$\cot 60^\circ = \frac{\cos 60^\circ}{\sin 60^\circ} = \frac{1}{2} \times \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$

$\cos 60^\circ = \frac{1}{2}$

$\sin 60^\circ = \frac{\sqrt{3}}{2}$

$\frac{2\left(\frac{1}{\sqrt{3}}\right)\overbrace{\left(1 - \frac{1}{3}\right)}^{\frac{2}{3}}}{\underbrace{\left(1 - \frac{1}{3}\right)^2}_{\left(\frac{2}{3}\right)^2 = \frac{4}{9}}} = \frac{\overbrace{\frac{2}{\sqrt{3}} \times \frac{2}{3}}^{\frac{4}{3\sqrt{3}}}}{\frac{4}{9}}$

$\frac{\cancel{4}}{\cancel{3}\sqrt{3}} \times \frac{\cancel{9}^{3}}{\cancel{4}} = \frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} \rightarrow \sqrt{3} =$

چون جواب داره پس $\theta = 60^\circ$

$\frac{60}{180} = \frac{R}{\pi} \rightarrow \frac{60\pi}{\cancel{180}_{3}} = \boxed{\frac{\pi}{3}}$

۶

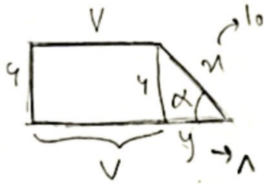
$\tan\theta = ۵ \rightarrow \underbrace{۱+\tan^۲\theta}_{۲۵} = \frac{۱}{\cos^۲\theta} \rightarrow \cos^۲ = \frac{۱}{۲۶} \rightarrow \cos\theta = \frac{۱}{\sqrt{۲۶}} \rightarrow \cos^۲\theta + \sin^۲\theta = ۱$

$\sin^۲\theta = ۱ - \frac{۱}{۲۶}$

$\sin\theta = \frac{۵}{\sqrt{۲۶}} \leftarrow \sin^۲\theta = \frac{۲۵}{۲۶}$

$$\frac{(۳\times\frac{۵}{\sqrt{۲۶}}) - \frac{۱}{\sqrt{۲۶}}}{\frac{۵}{\sqrt{۲۶}} - \frac{۴}{\sqrt{۲۶}}} = \frac{۱۴}{\cancel{\sqrt{۲۶}}} \times \frac{\cancel{\sqrt{۲۶}}}{۱} = \boxed{۱۴}$$

۷



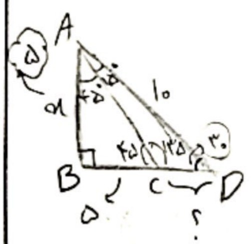
$\sin\alpha = \frac{۶}{x} = \frac{۶}{۱۰} \rightarrow x = ۱۰$

$\cos\alpha = \frac{y}{۱۰}$

$\underbrace{۶+۷}_{۱۳} + \overbrace{۱۰+۷}^{۱۷} + ۸ = \boxed{۳۸}$

$\cos^۲\alpha + \sin^۲\alpha = ۱ \rightarrow \frac{y^۲}{۱۰۰} + \frac{۳۶}{۱۰۰} = ۱ \rightarrow \frac{۶۴}{۱۰۰} = \frac{y^۲}{۱۰۰} \rightarrow \boxed{y = ۸}$

۸



$\frac{x}{۱۰} = \sin ۳۰^\circ = \frac{۱}{۲}$

$\frac{۱}{۲} = \frac{x}{۱۰} \rightarrow \boxed{x = ۵}$

$x^۲ + BD^۲ = ۱۰^۲$

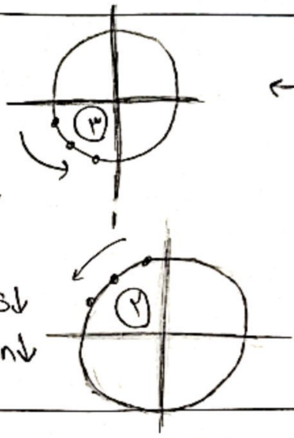
$BD^۲ = ۱۰^۲ - x^۲ \,(۲۵) \rightarrow BD = \sqrt{۱۰۰ - ۲۵} = \sqrt{۷۵} \rightarrow BD - BC = CD$

جواب

یا $۵ \Rightarrow \boxed{\sqrt{۷۵} - ۵}$

۹

الف) ناحیه‌ی سوم ←



$\cos\uparrow$
$\sin\downarrow$

$\cos\downarrow$
$\sin\downarrow$

ب) ناحیه‌ی دوم ←

۱۰

$\tan x = \frac{۱}{۳}$ انتهای کمان x در ناحیه‌ی سوم $\Rightarrow x \rightarrow \sin < ۰,\ \cos < ۰$

$\tan x = \frac{۱}{۳} \rightarrow \cot x = \frac{۳}{۱}$

$۱ + \cot^۲ x = \frac{۱}{\sin^۲ x} \rightarrow \underbrace{۱+۹}_{۱۰} = \frac{۱}{\sin^۲ x} \rightarrow \sin^۲ x = \frac{۱}{۱۰} \rightarrow \sin x = \pm\frac{۱}{\sqrt{۱۰}}$

$\rightarrow \boxed{\sin x = -\frac{۱}{\sqrt{۱۰}}}$