نام و نام خانوادگی ....[illegible]....   پاسخنامه تشریحی تکلیف شماره ..۱۷.. کلاس ....دهم ریاضی A....

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الف) $27^\circ = (x)\,rad \rightsquigarrow \frac{27}{180} = \frac{x}{\pi} \Rightarrow 27\pi = 180x \Rightarrow x = \frac{27\pi}{180} = \frac{3\pi}{20}$

ب) $125^\circ = (x)\,rad \rightsquigarrow \frac{125}{180} = \frac{x}{\pi} \Rightarrow 180x = 125\pi \Rightarrow x = \frac{125\pi}{180} = \frac{25\pi}{36}$

پ) $\frac{5\pi}{12}\,rad = (x)^\circ \rightsquigarrow \frac{\frac{5\pi}{12}}{\pi} \Rightarrow \frac{5}{12} = \frac{x}{180} \to 12x = 180\times 5 \rightsquigarrow x = \frac{180\times 5}{12} = 75^\circ$

ت) $\frac{4\pi}{9}\,rad = (x)^\circ \rightsquigarrow \frac{\frac{4\pi}{9}}{\pi} = \frac{4}{9} = \frac{x}{180} \rightsquigarrow 9x = 180\times 4 \rightsquigarrow x = \frac{180\times 4}{9} = 80^\circ$

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$10a^\circ$

$\frac{125a}{9}\,G \rightsquigarrow \frac{\frac{125a}{9}}{200} \rightsquigarrow \frac{125a}{9\times 200} = \frac{x}{180} \rightsquigarrow x = \frac{125a\times 180}{200\times 9} = 12.5a^\circ$

$\frac{a\pi}{8}\,rad \Rightarrow \frac{\frac{a\pi}{8}}{\pi} = \frac{a}{8} = \frac{y}{180} \to y = \frac{180a}{8} = 22.5a^\circ$

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

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الف) $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + 2\cot 45^\circ =$

$\underbrace{(\frac{1}{2}\times\frac{\sqrt{3}}{2})}_{\frac{\sqrt3}{4}} - \underbrace{(\frac{\sqrt{3}}{2}\times\frac{1}{2})}_{\frac{\sqrt3}{4}} - 1 + 2(1) = 1$

$\tan = \frac{\sin}{\cos}$, $\cot = \frac{\cos}{\sin}$

$\tan 45^\circ = \frac{\frac{\sqrt2}{2}}{\frac{\sqrt2}{2}} = 1$ / $\cot 45^\circ = 1$

ب) $\frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ}{\cot 30^\circ - \cot 60^\circ} = \frac{\frac{3}{9} + 1 + 3}{\sqrt3 - \frac{\sqrt3}{3}} = \frac{\frac{3+9+27}{9}}{\frac{3\sqrt3 - \sqrt3}{3}} = \frac{\frac{39}{9}}{\frac{2\sqrt3}{3}} = \frac{\frac{13}{3}}{\frac{2\sqrt3}{3}} = \frac{13\sqrt3}{6}$

$\frac{13}{2\sqrt3}\times\frac{\sqrt3}{\sqrt3}$

$\tan^2 30^\circ = (\frac{\sqrt3}{3})^2 = \frac{3}{9}$ $\tan^2 60^\circ = (\sqrt3)^2 = 3$

$\tan 45^\circ = 1$ $\cot 30^\circ = \sqrt3$ $\cot 60^\circ = \frac{\sqrt3}{3}$

$\frac{13\sqrt3}{6}$

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$-\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin^2\theta$

$\underbrace{(-\frac{1}{2}\times\frac{1}{2})}_{\frac{-1}{4}} + \underbrace{(\frac{\sqrt3}{2}\times\frac{\sqrt3}{2})}_{\frac{3}{4}} = \frac{-1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} \rightsquigarrow \sin^2\theta = \frac12 \rightsquigarrow \sin\theta = \pm\frac{1}{\sqrt2} \Rightarrow \pm\frac{\sqrt2}{2}$

$\cos^2 = 1 - \sin^2 = 1 - \frac12 = \frac12 \to \cos\theta = \pm\frac{\sqrt2}{2}$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \pm 1$

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$\frac{2\tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} = \tan\theta \rightsquigarrow \frac{2(\frac{\sqrt3}{3})(\cancel{1 - \frac{3}{9}})}{(1 - \frac{3}{9})^2} = \frac{\frac{2\sqrt3}{3}}{1 - \frac{3}{9}} = \frac{\frac{2\sqrt3}{3}}{\frac{6}{9}} = \frac{3\sqrt3}{3}$ $* \; 90^\circ > \theta$

$\tan\theta = \sqrt3 \rightsquigarrow \frac{\sin\theta}{\cos\theta} = \sqrt3 \rightsquigarrow \frac{\frac{\sqrt3}{2}}{\frac12} = \sqrt3 \Rightarrow \theta = 60^\circ \rightsquigarrow rad(x) = 60^\circ$

$\frac{60}{180} = \frac{x}{\pi} \Rightarrow 180x = 60\pi$

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

$\tan 30^\circ = \frac{\sqrt3}{3} \to (\frac{\sqrt3}{3})^2 = \frac{3}{9}$ $\cot^2 60^\circ = (\frac{\sqrt3}{3})^2 = \frac{3}{9}$

$\tan\theta = ۵ \rightsquigarrow \sin , \cos$ ؟

$1+\tan^2\theta = \frac{1}{\cos^2\theta} \rightsquigarrow 1+۲۵ = ۲۶ = \frac{1}{\cos^2\theta} \Rightarrow \cos^2\theta = \frac{1}{۲۶} \to \cos\theta = \pm\frac{1}{\sqrt{۲۶}}$

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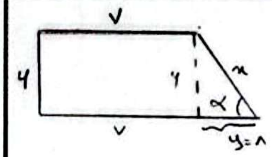
$\sin^2 = 1-\cos^2 = \frac{۲۶-۱}{۲۶} = \frac{۲۵}{۲۶} \rightsquigarrow \sin\theta = \pm\frac{۵}{\sqrt{۲۶}}$

$$\frac{۳\sin\theta-\cos\theta}{\sin\theta-۴\cos\theta} = \frac{۳\left(\pm\frac{۵}{\sqrt{۲۶}}\right)-\left(\pm\frac{1}{\sqrt{۲۶}}\right)}{\pm\frac{۵}{\sqrt{۲۶}}-۴\left(\pm\frac{1}{\sqrt{۲۶}}\right)} = \frac{\frac{\pm۱۵-(\pm۱)}{\sqrt{۲۶}}}{\frac{\pm۵-(\pm۴)}{\sqrt{۲۶}}} = \begin{cases} \frac{۱۵-۱}{۵-۴} = ۱۴ \\ \frac{-۱۵+۱}{-۵+۴} = \frac{-۱۴}{-۱} = ۱۴ \end{cases}$$

جواب آخر = ۱۴



$\sin\alpha = \frac{۶}{۱۰}$

$\rightsquigarrow \sin = \frac{\text{مقابل}}{\text{وتر}} = \frac{۶}{x} = \frac{۶}{۱۰} \rightsquigarrow x = ۱۰$

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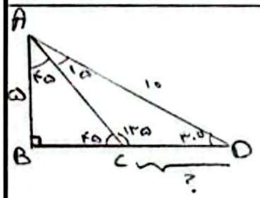
$y^2 = ۱۰^2 - ۶^2 = ۱۰۰ - ۳۶ = ۶۴ \Rightarrow y = ۸$

$P = ۶ + ۷ + ۱۰ + ۸ + ۷ = \underline{۳۸}$



$AB \to ۳۰^\circ$ روبرو $\rightsquigarrow \frac{\overline{AB}}{۱۰} = \frac{1}{۲} , ۲\overline{AB} = ۱۰ \to \overline{AB} = ۵$

$ABC \to$ متساوی‌الساقین $\Rightarrow \overline{AB} = \overline{BC} = ۵$ *

BD (فیثاغورث) $: BD^2 = ۱۰^2 - ۵^2 = ۱۰۰ - ۲۵ = ۷۵ \to BD = \sqrt{۷۵} = ۵\sqrt{۳}$ *

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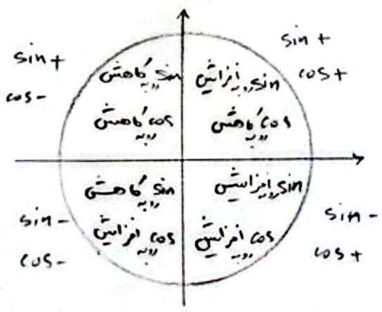
$CD = BD - BC = ۵\sqrt{۳} - ۵$

فاکتورگیری $= ۵(\sqrt{۳}-۱)$

الف) ناحیه سوم



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ب) ناحیه دوم

$\tan x = \frac{1}{۳} \rightsquigarrow \tan^2 x = \frac{1}{۹}$

ناحیه سوم

$1+\tan^2 x = \frac{1}{\cos^2 x} \rightsquigarrow 1+\frac{1}{۹} = \frac{۱۰}{۹} = \frac{1}{\cos^2 x} \rightsquigarrow \cos^2 x = \frac{۹}{۱۰} \Rightarrow \cos x = \ominus\frac{۳}{\sqrt{۱۰}}$

ناحیه سوم

۱۰

$\sin^2 x = 1-\cos^2 x = 1-\frac{۹}{۱۰} = \frac{1}{۱۰} \rightsquigarrow \sin x = \ominus\frac{1}{\sqrt{۱۰}}$

$\sin x = -\frac{1}{\sqrt{۱۰}}$