۱۹/۵

نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ۱۶ کلاس ....

۱ (۲)

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

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

ج) $\frac{5\pi}{12}\, Rad = (x)^\circ \Rightarrow \frac{\frac{5\pi}{12}}{\pi} = \frac{x}{180} \Rightarrow x = 15\times 5 = 75^\circ$ ✓

د) $\frac{4\pi}{9}\, rad = (x)^\circ \Rightarrow \frac{\frac{4\pi}{9}}{\pi} = \frac{x}{180} \Rightarrow x = 20\times 4 = 80^\circ$ ✓

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$\frac{1250}{9}\, G = (x)^\circ \Rightarrow \frac{\frac{1125}{9}}{200} = \frac{x}{180} \Rightarrow x = 12/5^\circ$ ✓

$\frac{5\pi}{8}\, rad = (x')^\circ \Rightarrow \frac{\frac{5\pi}{8}}{\pi} = \frac{x'}{180} \Rightarrow 22/5^\circ = x'$ ✓

$105 + 12/5 + 22/5 = 140\ a = 180 \Rightarrow a = 40^\circ$ ✓

۳ (۲)

الف) $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + 2\cot 45^\circ =$
$\frac{1}{2}\cdot\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2}\cdot\frac{1}{2} - 1 + 2 = 1$ ✓

ب) $\frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ}{\cot 30^\circ - \cot 60^\circ} \Rightarrow \tan 30^\circ = \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{1}{\sqrt{3}} \Rightarrow \tan^2 30^\circ = \frac{1}{3}$ ، $\tan^2 45^\circ = 1$ ، $\tan^2 60^\circ = 3 \Rightarrow \frac{\frac{1}{3}+1+3}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}} \Rightarrow \frac{13}{2\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}} = \frac{13\sqrt{3}}{6}$ ✓

$\cot 30^\circ - \cot 60^\circ = \sqrt{3} - \frac{\sqrt{3}}{3} = \frac{2\sqrt{3}}{3}$

۴ (۲)

$-\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin^2\theta$
$-\frac{1}{2}\cdot\frac{1}{2} + \frac{\sqrt{3}}{2}\cdot\frac{\sqrt{3}}{2} = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} \Rightarrow \sin\theta = \frac{1}{\sqrt{2}}$

$\frac{1}{2} = 1 - \cos^2\theta \Rightarrow -\frac{1}{2} = -\cos^2\theta \Rightarrow \cos\theta = \frac{1}{\sqrt{2}} \Rightarrow \tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} = 1$ ✓

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$\frac{2\tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} \Rightarrow 2\times\frac{1}{\sqrt{3}}\left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right) = \frac{2}{\sqrt{3}} \times \frac{2}{3} = \frac{4}{3\sqrt{3}}$

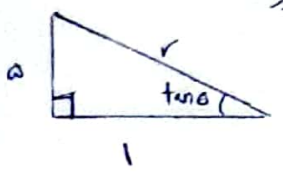
$\Rightarrow \left(1 - \cot^2 60^\circ\right)^2 = \left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right)^2 = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$

$\frac{\frac{4}{3\sqrt{3}}}{\frac{4}{9}} = \frac{3}{\sqrt{3}} \Rightarrow \frac{3}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$ ✓

$\tan\theta = \sqrt{3} \rightarrow \theta = \frac{\pi}{3}$

سوال θ رو می‌خواد!

$\tan\theta = 5 = \frac{\text{مقابل}}{\text{مجاور}} = \frac{5}{1} \Rightarrow r = \sqrt{5^2+1^2} = \sqrt{26} \Rightarrow \sin\theta = \frac{\text{مقابل}}{\text{وتر}}$



$\frac{5}{\sqrt{26}} \Big/ \cos\theta = \frac{\text{مجاور}}{\text{وتر}} = \frac{1}{\sqrt{26}} \Rightarrow \frac{3\sin\theta - \cos\theta}{\sin\theta - 4\cos\theta} = \frac{\frac{15}{\sqrt{26}} - \frac{1}{\sqrt{26}}}{\frac{5}{\sqrt{26}} - \frac{4}{\sqrt{26}}} = \frac{\frac{14}{\sqrt{26}}}{\frac{1}{\sqrt{26}}} = \frac{14}{1} = 14$ ✓

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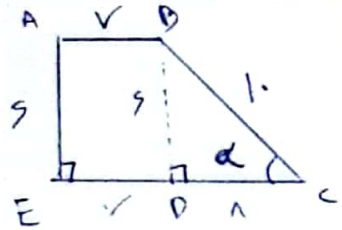

$\sin\alpha = \frac{6}{10} \Rightarrow \frac{\text{مقابل}}{\text{وتر}} = \frac{6}{10}$

$10^2 = 6^2 + DC^2 \Rightarrow DC^2 = 64 \Rightarrow DC = 8$

محیط مثلث $= 7+10+15+6 = 38$ ✓

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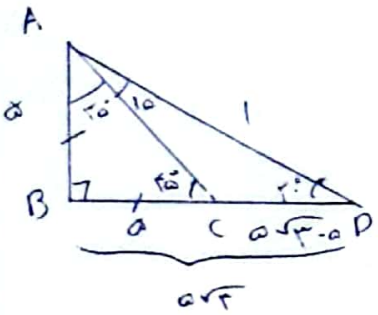

$\sin 30 = \frac{1}{2} = \frac{\text{مقابل}}{\text{وتر}} = \frac{AB}{10} \Rightarrow AB = a = BC$

$\cos 30 = \frac{\sqrt{3}}{2} = \frac{\text{مجاور}}{\text{وتر}} = \frac{BD}{10} \Rightarrow BD = a\sqrt{3}$

$BD = BC + CD \Rightarrow CD = BD - BC = a\sqrt{3} - a$ ✓

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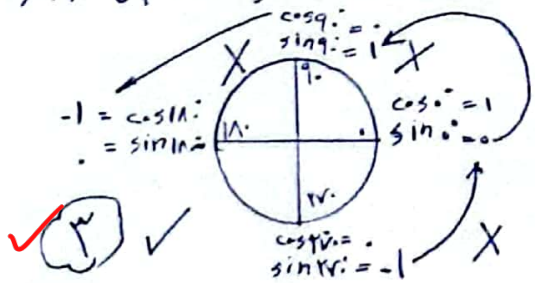
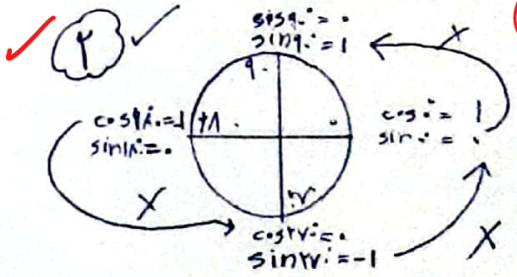
الف) if $\theta\uparrow \Rightarrow \sin\theta\downarrow, \cos\theta\uparrow$



ب) if $\theta\uparrow \Rightarrow \sin\theta\downarrow, \cos\theta\uparrow$



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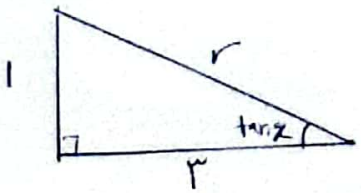

$\tan\alpha = \frac{\text{مقابل}}{\text{مجاور}} = \frac{1}{3} \Rightarrow r = \sqrt{3^2+1^2} = \sqrt{10}$

$\sin\alpha = \frac{\text{مقابل}}{\text{وتر}} = \frac{1}{\sqrt{10}} \overset{\text{زاویه حاده}}{\Rightarrow} \sin\alpha = \frac{1}{\sqrt{10}}$ ✓

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