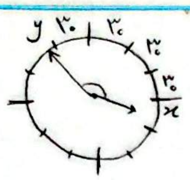
نام و نام خانوادگی: آترین فروتن   پاسخنامه تشریحی تکلیف شماره ـــ   کلاس دهم دختر)

۲۰

سوال ۱)

الف)



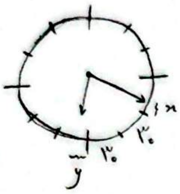
$x = \frac{54}{2} = 27$ $y = 1 \times 6 = 6$

$\alpha = 30 + 30 + 30 + 30 + 27 + 6 = 153^\circ$

ب) $\alpha = |5/5M - 30H| \rightarrow |5/5(54) - 30(3)| = |297 - 90| = 207 \rightarrow 360 - 207 = 153^\circ$

سوال ۲)

الف)



$y = \frac{18}{2} = 9^\circ$ $x = 2 \times 6 = 12^\circ$

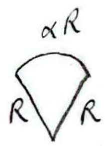
$\alpha = 12 + 30 + 30 + 9 = 81^\circ$

ب) $\alpha = |5/5M - 30H| = |5/5(18) - 30(6)| = \overbrace{|99 - 180|}^{-81} = 81^\circ$

سوال ۳)

الف) $S = \frac{\alpha}{2} R^2 \rightarrow \frac{\frac{\pi}{6}}{2} \times 3^2 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4}$

ب) محیط $= \alpha R + 2R \rightarrow \frac{\pi}{6} \times 3 + 2 \times 3 = \frac{\pi}{2} + 6$



سوال ۴)

الف) $S = \frac{1}{2} AB \times AC \times \sin 60^\circ = \frac{1}{2} \times 5 \times 8 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

ب) $a = \sqrt{b^2 + c^2 - 2bc \cos A} = \sqrt{8^2 + 5^2 - 2(8)(5)(\frac{1}{2})} = \sqrt{89 - 40} = \sqrt{49} = 7$ محیط $= 8 + 5 + 7 = 20$

سوال ۵)

$\hat{A} = 180 - 150 = 30^\circ$ $\frac{a}{\sin A} = \frac{b}{\sin B} \longrightarrow \frac{15}{\frac{1}{2}} = \frac{15\sqrt{2}}{\sin B} \longrightarrow \sin B = \frac{15\sqrt{2}}{30} = \frac{\sqrt{2}}{2}$

$\sin B = \frac{\sqrt{2}}{2} \rightarrow \hat{B} = 45 \rightarrow$ (چون زاویه حاده است)

$\hat{C} = 150 - 45 = 105$

$\hat{B}: \frac{45}{180} = \frac{rad}{\pi} \rightarrow rad = \frac{45\pi}{180} = \boxed{\frac{\pi}{4}}$

$\hat{C}: \frac{105}{180} = \frac{rad}{\pi} \longrightarrow rad = \frac{105\pi}{180} = \boxed{\frac{7\pi}{9}}$

سوال ۶)

$$\frac{\tan(\pi - \alpha) + 3\tan(\pi + \alpha)}{\tan(2\pi - \alpha) - \tan(2\pi + \alpha)} = \frac{-\tan\alpha + 3\tan\alpha}{-\tan\alpha - \tan\alpha} = \frac{2\tan\alpha}{-2\tan\alpha} = -1$$

سوال ۷)

$\frac{rad}{\pi} = \frac{D}{180} \rightarrow \frac{\frac{\pi}{12}}{\pi} = \frac{D}{180} \rightarrow D = \frac{180}{12} = 15^\circ$

$$A = \frac{2\tan(\frac{\pi}{2} - \frac{\pi}{12}) + \tan(\frac{\pi}{2} + \frac{\pi}{12})}{3\tan(\pi - \frac{\pi}{12}) - \tan(\frac{3\pi}{2} - \frac{\pi}{12})} = \frac{\overbrace{2\cot\frac{\pi}{12} - \cot\frac{\pi}{12}}^{\cot\frac{\pi}{12}}}{-3\tan\frac{\pi}{12} - \cot\frac{\pi}{12}} = \frac{\frac{1}{a}}{-3a - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-3a^2 - 1}{a}} = \frac{1}{-3a^2 - 1}$$

سوال ۸)

$$\frac{\sin^2 x+\cos^2 x+2\sin x\cos x+\sin^2 x+\cos^2 x-2\sin x\cos x}{\sin^2 x-\cos^2 x}=\frac{(\sin x+\cos x)^2+(\sin x-\cos x)^2}{(\sin x-\cos x)(\sin x+\cos x)}$$

مخرج مشترک

$$\frac{1+1}{\sin^2 x-\cos^2 x}=\frac{2}{\sin^2 x-\cos^2 x}\xrightarrow{\div \cos^2 x}\frac{\frac{2}{\cos^2 x}}{\tan^2 x-1}=\frac{2(1+\tan^2 x)}{\tan^2 x-1}=3\longrightarrow 2+2\tan^2 x=3\tan^2 x-3$$

$$\downarrow$$

$$\boxed{\tan^2 x=5}$$

سوال ۹)

صورت و مخرج را بر $\cos^2 x$ تقسیم می‌کنیم

$$\longrightarrow \frac{\tan^2 x-2+\frac{1}{\cos^2 x}}{\tan^2 x+2-\frac{1}{\cos^2 x}}=\frac{\tan^2 x-2+\tan^2 x+1}{\cancel{\tan^2 x}+2-\cancel{\tan^2 x}-1}=2\tan^2 x-1$$

$$2\tan^2 x-1=4\longrightarrow 2\tan^2 x=5\longrightarrow \tan^2 x=\frac{5}{2}=2/5$$

سوال ۱۰)

الف) $\cos^2\alpha=\frac{1+\cos 2\alpha}{2}\longrightarrow \cos^2(22/5)=\frac{1+\cos 45^\circ}{2}=\frac{1+\frac{\sqrt{2}}{2}}{2}=\frac{\frac{2+\sqrt{2}}{2}}{2}=\frac{2+\sqrt{2}}{4}$

$$\longrightarrow \cos(22/5^\circ)=\sqrt{\frac{2+\sqrt{2}}{4}}=\frac{\sqrt{2+\sqrt{2}}}{2}$$

ب) $\sin^2\alpha=\frac{1-\cos 2\alpha}{2}$ $\quad \sin^2(67/5)=\frac{1-\cos 135^\circ}{2}=\frac{\frac{2+\sqrt{2}}{2}}{2}=\frac{2+\sqrt{2}}{4}\longrightarrow \sin(67/5^\circ)=\frac{\sqrt{2+\sqrt{2}}}{2}$

یا از همان اول می‌توانستیم بگوییم ۲۲/۵ و ۶۷/۵ متمم هستند پس $\cos(22/5^\circ)=\sin(67/5^\circ)$