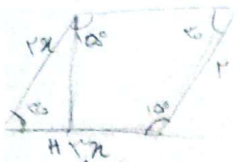
۱)



$\sin 30^\circ = \frac{1}{2} \Rightarrow HH' = 12 \quad \rightarrow S = 2x \times 3x = 6x^2 = 96$

$2x = \sqrt{18}$

$(3\sqrt{2})$

$b = 10x \rightarrow 3\sqrt{2} \times 10 = 30\sqrt{2}$

۲)

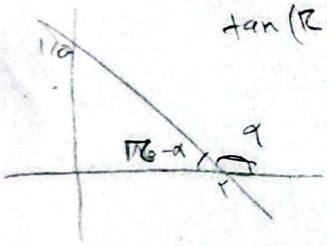
۳)

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha < 0$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\frac{\cos\alpha}{\sin\alpha}} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow \sin\alpha < 0$

$\Rightarrow$ ربع سوم

۴)



$\tan(\pi - \alpha) = \frac{11a}{2} \Rightarrow \tan\alpha = -\frac{3}{2}$

$\tan\left(\frac{\pi}{2} - \alpha\right) = \cot\alpha \rightarrow -\frac{2}{3}$

۵)

$\frac{2\cos(270 - 22) - 2\sin(180 - 22)}{\sin(180 + 22) - \cos(270 + 22)} = \frac{-2\sin 22 - 2\sin 22}{-\sin 22 - \sin 22} = \frac{-4\sin 22}{-2\sin 22} = \frac{4}{2} = 2$

۶)

$\cos\alpha > 0 \quad \sin\alpha < 0 \quad \cos\alpha = \frac{2}{3} \quad \sin\alpha = \frac{-\sqrt{5}}{3} \quad \tan\alpha = \frac{-\frac{\sqrt{5}}{3}}{\frac{2}{3}} = -\frac{\sqrt{5}}{2}$

$\tan^2\alpha = \frac{5}{4}$

$\frac{\sin\left(\frac{\pi}{2} + \alpha\right) - \sin(\alpha - \pi)}{|\tan^2\alpha - 1|} = \frac{\cos\alpha + \sin\alpha}{|\tan^2\alpha - 1|} = \frac{\frac{2}{3} - \frac{\sqrt{5}}{3}}{\frac{1}{4}} = \frac{\frac{2-\sqrt{5}}{3}}{\frac{1}{4}}$

$\Rightarrow \frac{2-\sqrt{5}}{12}$

7)

$\sin\alpha = 2\cos\alpha$ ناحیه‌ی سوم = α → $\cos\alpha < 0$, $\sin\alpha < 0$

$\sin^2\alpha + \cos^2\alpha = 1 \to 4\cos^2\alpha + \cos^2\alpha = 5\cos^2\alpha = 1 \to \cos^2\alpha = \frac{1}{5}$ $\cos\alpha = \pm\frac{1}{\sqrt{5}}$ (غ ق ق)

$\Longrightarrow -\frac{1}{\sqrt{5}}$

8)

شیب $= \tan 60^\circ = \sqrt{3}$

$2mx + (m^2-1)y = 3 \to (m^2-1)y = -2mx + 3$

$y = \frac{-2m}{m^2-1}x + \frac{3}{m^2-1} \Longrightarrow \frac{-2m}{m^2-1} = \sqrt{3}$

$\sqrt{3}m^2 + 2m - \sqrt{3} = 0$

$m^2 + 2m - 3 =$

$(m-1)(m+3)$

$m = \frac{-3}{\sqrt{3}}$ $m = \frac{1}{\sqrt{3}}$ $\Rightarrow \frac{1}{\sqrt{3}} - \frac{-3}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

9)

$-\frac{\pi}{4} < x < \frac{\pi}{4} \to -1 < \tan x < 1$

$1 > \tan(-x) > -1$

$\infty > \tan(\frac{\pi}{4} - x) > 0$

$\Longrightarrow \tan(\frac{\pi}{4} - x) > 0 \to \frac{1-m}{2+m} > 0$

-2		1	
$-$	$+$		$-$

$\Rightarrow (-2, 1)$

10)

$\frac{5\pi}{3}$, $\frac{7\pi}{6}$, $\frac{2\pi}{3}$, $\frac{2\pi}{3}$

$\tan(300)\cos(210) + \tan(120)\sin(120)$

$(-\sqrt{3})(-\frac{\sqrt{3}}{2}) + (-\sqrt{3})(\frac{\sqrt{3}}{2}) = \frac{3}{2} - \frac{3}{2} = 0$

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