۱- $3\sqrt{2}$

$S = 54 \quad = 2\left(\frac{1}{2} \times 2x \times 3x \times \sin 150^\circ\right) = 3x^2 = 54$

$x^2 = 18$

$x = \sqrt{18} = 3\sqrt{2}$

۲- $S_{ABC} - S_{ADE} = 1.75$

$\frac{35 \sin A}{2} - \frac{28 \sin A}{2} = 1.75 \Rightarrow 35 \sin A - 28 \sin A = 3.5$

$7 \sin A = 3.5$

$\sin A = 0.5 \Rightarrow A = 30^\circ \Rightarrow$

$\tan A = \frac{\sqrt{3}}{3}$

۳- $\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|} = \frac{1}{|\cos\alpha|} - \tan\alpha = \frac{1}{|\cos\alpha|} + \frac{\sin\alpha}{|\cos\alpha|}$

$\cos\alpha < 0$ (۱)

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \Rightarrow \sin\alpha < 0$ (۲)

(۱), (۲) $\Rightarrow$ ناحیه سوم

۴- $\tan\beta = \frac{3}{4}$

$\hat{\beta} + \hat{\alpha} = 180^\circ \Rightarrow \tan\beta = -\tan\alpha$

$\tan\hat{\alpha} = -\frac{3}{4}$

۵- $\tan\left(\frac{\pi}{2} - \alpha\right) = \cot\alpha = \frac{-4}{3}$

$\frac{3\cos(248^\circ) - 2\sin(158^\circ)}{\sin 202^\circ - \cos(292^\circ)} = \frac{3\sin(202) + 2\sin(202)}{\sin(202) + \sin(202)} = \frac{5}{2} =$

2.5

/ /

۶

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

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

$$\boxed{\frac{8-4\sqrt{5}}{3}}$$

✓

$\sin\alpha = 2\cos\alpha \qquad \sin^2\alpha + \cos^2\alpha = 1 \Rightarrow 4\cos^2\alpha + \cos^2\alpha = 1$

$5\cos^2\alpha = 1$

$\cos^2\alpha = \frac{1}{5}$

$\cos\alpha = \pm\frac{\sqrt{5}}{5} \Rightarrow$

$\cos\alpha < 0 \Rightarrow \boxed{-\frac{\sqrt{5}}{5}}$

۸

$2mx + (m^2-1)y = 3 \Rightarrow -\frac{2m}{m^2-1} = \sqrt{3} \Rightarrow -2m = \sqrt{3}m^2 - \sqrt{3} \Rightarrow$

$\sqrt{3}m^2 + 2m - \sqrt{3} \Rightarrow$ $\qquad \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{4-(-12)}}{\sqrt{3}} = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$

$\tan 60^\circ = \sqrt{3}$

$$\frac{4\sqrt{3}}{3}$$

۹

$\tan\left(\frac{\pi}{4} - x\right) = \frac{1-m}{m+2}$ و $-\frac{\pi}{4} < x < \frac{\pi}{4}$

$x = \frac{\pi}{4} \Rightarrow \tan 0 = 0$

$x = -\frac{\pi}{4} \Rightarrow \tan\frac{\pi}{2} =$ تعریف نشده ($+\infty$)

$\frac{1-m}{2+m} > 0 \Rightarrow$

	-2		1	
$-$	ت.ن	$+$	0	$-$

$m \in (-2, 1)$

۱۰

$\tan(300^\circ)\cos(210^\circ) + \tan(480^\circ)\sin(150^\circ) =$

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

صفر