۱۹ ۲۶ سپیر علائی

۱- $3\sqrt{2}$ (۱٫۵)

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

$x^2 = 18$

$x = \sqrt{18} = 3\sqrt{2}$ ✓ ← محیط $= 2(2x + 3x) = 10x = 30\sqrt{2}$

۲- (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- (۲)

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

$\cos\alpha < 0$ (۱)

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

(۱) (۲) $\Rightarrow$ ناحیه سوم ✓

۴- (۱٫۵)

$\tan B = \frac{3}{4}$ $\hat{\beta} + \hat{\alpha} = 180^\circ \Rightarrow \tan\beta^\circ = -\tan\alpha^\circ$

$\tan\hat{\alpha} = -\frac{3}{4}$ ✓ $\tan(\frac{\pi}{2} - \alpha) = \cot\alpha = \frac{-4}{3}$

۵- (۲)

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

$\frac{3\cos(248^\circ) - 2\sin(158^\circ)}{\sin 202^\circ - \cos(292^\circ)} = \frac{3\sin(202) + 2\sin(202)}{\sin(202) + \sin(22)} = \frac{5}{2} =$

$2/5$ ✓

۱۱

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

$\sin\left(\frac{\pi}{2}+\alpha\right) = \sin(\alpha-\pi)$ (۲)

$$\frac{\left|\tan^2\alpha - 1\right|}{} = \frac{\frac{3}{4} + \left(-\frac{\sqrt{5}}{3}\right)}{\frac{3}{4} - \frac{3}{5}} = \frac{\frac{9-4\sqrt{5}}{12}}{\frac{1}{20}} =$$

$$\frac{45 - 16\sqrt{5}}{3}$$ ✓

۷- $\sin\alpha = 2\cos\alpha$ $\sin^2\alpha + \cos^2\alpha = 1 \Rightarrow 4\cos^2\alpha + \cos^2\alpha = 1$ (۲)

$5\cos^2\alpha = 1$

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

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

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

۸- $2mx + (m^2-1)y = 2 \Rightarrow \frac{-2m}{m^2-1} = \sqrt{3} \Rightarrow -2m = \sqrt{3}m^2 - \sqrt{3}$

$\sqrt{3}m^2 + 2m - \sqrt{3} = 0$ (۲)

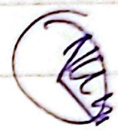
$\tan\theta = \sqrt{3}$

$\frac{\sqrt{5}}{|a|} = \frac{\sqrt{4-(-1)^2}}{\sqrt{2}} = \frac{3}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\frac{\sqrt{3}}{3}$ ✓

9

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



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

$$x = -\frac{\pi}{4} \Rightarrow \tan\frac{\pi}{2} = +\infty$$

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

$$m \in (-2, 1)$$

10

$$\tan(300^\circ)\cos(210^\circ) + \tan(480^\circ)\sin(120^\circ) =$$

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

صفر