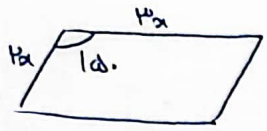
1



$\frac{1}{2} \times 2x \times 3x \times \sin 150^\circ = 3x^2 = 54 \rightarrow x^2 = 18 \rightarrow x = 3\sqrt{2}$

$(\underbrace{3x+2x}_{5x}) \times 2 = \boxed{30\sqrt{2}}$

2

$|S_{ABC} - S_{ADE}| = 11/75 \rightarrow \frac{4^2 \times 7}{2} \times \sin\hat{A} - \frac{5 \times 7}{2} \times \sin\hat{A} = 11/75 \rightarrow \left|\frac{7}{\sin\hat{A}}(2 - 2/05)\right| = 11/75$

$\sin\hat{A} = 0/5 = \frac{1}{2} \rightarrow \hat{A} = 30^\circ, 150^\circ \rightarrow \tan\hat{A} = \pm\frac{\sqrt{3}}{3}$

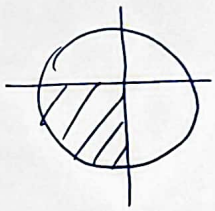
$7\sin\hat{A} = 3/5 \rightarrow \sin\hat{A} = 0/5 = \frac{1}{2}$

3

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \rightarrow \cos\alpha \neq 0 \rightarrow \underbrace{\sin\alpha}_{-} \times \underbrace{|\sin\alpha|}_{+} = -1 \rightarrow \sin\alpha < 0$

$\frac{1}{\frac{1}{\sin\alpha}}$

نتیجه 3



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

$\cos\alpha > 0 \rightarrow \frac{1-\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{\cos\alpha}$ ×

$\cos\alpha < 0 \rightarrow \frac{-1-\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{-\cos\alpha}$ ✓ , $\cos\alpha < 0$

4

$\tan(\frac{\pi}{2} - \alpha) = \cot\alpha \rightarrow \cot\alpha = \frac{2}{11/5} = 2 \times \frac{10}{55} = \frac{-4}{3}$

$\tan\alpha = -\frac{11/5}{2}$

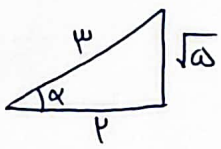
5

$\frac{3\cos(24^\circ) - 2\sin(158)}{\sin(20^\circ) - \cos(294^\circ)} = \frac{3\cos(270^\circ - 22^\circ) - 2\sin(180^\circ - 22^\circ)}{\sin(180^\circ + 22^\circ) - \cos(270^\circ + 22^\circ)} = \frac{3\cos(\frac{3\pi}{2} - 22^\circ) - 2\sin(\pi - 22^\circ)}{\sin(\pi + 22^\circ) - \cos(\frac{3\pi}{2} + 22^\circ)}$

$\frac{-3\sin 22^\circ - 2\sin 22^\circ}{-\sin 22^\circ - \sin 22^\circ} = \frac{-5\sin 22^\circ}{-2\sin 22^\circ} = 2/5$

6

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



$\frac{\frac{2+\sqrt{5}}{3}}{\frac{1}{4}} = \frac{8+4\sqrt{5}}{3}$

7

$\sin\alpha = 2\cos\alpha$ ، $\sin^2\alpha + \cos^2\alpha = 1 \longrightarrow 5\cos^2\alpha = 1$ ، $\cos^2\alpha = \frac{1}{5}$ ، $\cos\alpha = \pm\frac{1}{\sqrt{5}}$

$\cos\alpha = -\frac{\sqrt{5}}{5}$

8

$2mx + (m^2-1)y = 3$ ،

$\frac{3 - 2mx}{m^2-1} = y \rightarrow \frac{3}{m^2-1}\left(-\frac{2m}{m^2-1}\right)x = y \quad \left|-\frac{2m}{m^2-1}\right| = \sqrt{3}$ ،

شیب

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

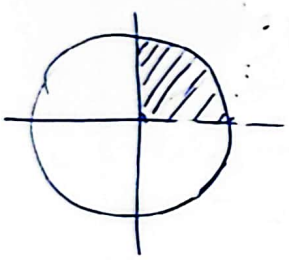
$\sqrt{3}\,m^2 - \sqrt{3} = 2m$ ، $\sqrt{3}m^2 - 2m - \sqrt{3} = 0$ ، $m^2 - 2m - 3 = 0$ ، $(m-3)(m+1) = 0$ ✓

$m = 3 \leftarrow m = \frac{3}{\sqrt{3}} = \sqrt{3}$

$m = -1 \leftarrow m = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

اختلاف $= \sqrt{3} \ominus \frac{\sqrt{3}}{3} = \frac{3\sqrt{3}}{3}$

9



$\tan\left(\frac{\pi}{4} - x\right) \Rightarrow -\frac{\pi}{4} < x < \frac{\pi}{4} \xrightarrow{\times -1} \frac{\pi}{4} > -x > -\frac{\pi}{4} \xrightarrow{+\frac{\pi}{4}} \frac{\pi}{2} > \frac{\pi}{4} - x > 0 \rightarrow$

$+\infty \hookleftarrow \left(\frac{1}{0}\right) > \tan\left(\frac{\pi}{4} - x\right) > 0$

$0 < \frac{1-m}{2+m} < \infty$

$-2 \quad 1$

$- \phi + \phi -$ $\rightarrow m = (-2, 1)$

10

$\tan(300^\circ) \times \cos(210^\circ) + \tan(480^\circ) \times \sin(840^\circ) = ?$

$-\sqrt{3}$ $\quad -\frac{\sqrt{3}}{2}$ $\quad \tan(120^\circ)$ $\quad \sin(120^\circ)$

$-\sqrt{3}$ $\quad \frac{\sqrt{3}}{2}$

$\frac{3}{2}$ $\quad -\frac{3}{2}$