نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۸ ... کلاس .....

۱

الف) $= -1 + \left(\frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2}\right) = \frac{-4+1}{4} = -\frac{3}{4}$

ب) $\left(\frac{\sqrt{3}}{3} \times \frac{\sqrt{3}}{2}\right) + \frac{1}{2} = 1$

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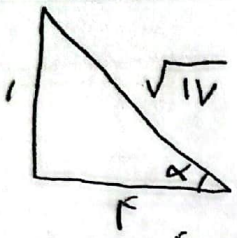

$\cos\alpha = \frac{4}{\sqrt{17}}$

$\sin\alpha = \frac{\sqrt{17}}{17}$

$\frac{(3 \times \frac{4}{\sqrt{17}}) - \frac{\sqrt{17}}{17}}{\frac{4}{\sqrt{17}} + 1} = \frac{\frac{11}{\sqrt{17}}}{\frac{5}{\sqrt{17}}} = \frac{11}{5}$

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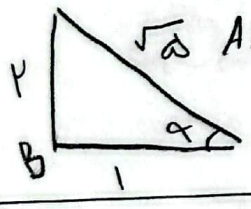
$\sin\alpha = 2\cos\alpha$

$\frac{AB}{AC} = \frac{2BC}{AC}$

A



$AB = 2BC$

$\cos\alpha = -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5}$

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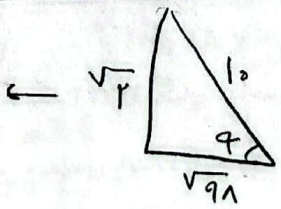
الف)

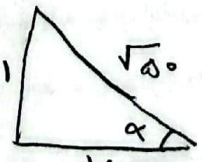


$\cos\frac{11\pi}{4} + \cos\alpha = -\frac{\sqrt{2}}{2} - \frac{\sqrt{98}}{10} = \frac{-5\sqrt{2} - \sqrt{2}\sqrt{2}}{10} = \frac{-12\sqrt{2}}{10}$

$\cos\alpha = -\frac{\sqrt{98}}{10}$

$\frac{4\sqrt{2}}{5}$

ب)



$\sin\frac{13\pi}{4} + \sin\alpha = -\frac{\sqrt{2}}{2} + \frac{\sqrt{50}}{50} = \frac{5\sqrt{2} - \sqrt{2}}{50} = \frac{4\sqrt{2}}{25}$

$\sin\alpha = \frac{\sqrt{50}}{50}$

$\frac{2\sqrt{2}}{25}$

۵

$2\sin^2\theta + \cos^2\theta = \frac{4}{3}$

$\cos^2\theta + \sin^2\theta + \sin^2\theta = \frac{4}{3}$

1

$\sin^2\theta = \frac{1}{3} \longrightarrow \cos^2\theta = \frac{2}{3}$

$\sin\theta = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$ $\quad \cos\theta = \frac{\sqrt{3}}{3}$

$\tan^2\theta = \frac{\sin^2\theta}{\cos^2\theta} = \frac{\frac{2}{3}}{\frac{1}{3}} = 2$

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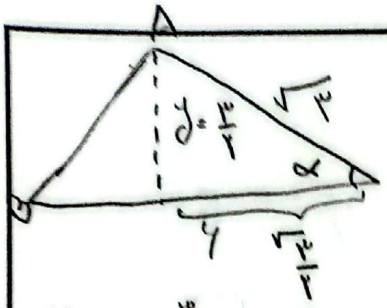

$\frac{1}{2} \times 2 \times y = \frac{9}{2} \rightarrow xy = \frac{9}{2}$ $y = \frac{3}{2}$

$x^2 - \frac{9}{4} = \frac{12-9}{4} = \frac{3}{4} \rightarrow \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$

$\sin\alpha = \frac{\frac{3}{2}}{\sqrt{12}} = \frac{\sqrt{3}}{4}$ $\cos\alpha = \frac{\frac{\sqrt{3}}{2}}{\sqrt{4}} = \frac{1}{4}$ $\min\alpha = 60^\circ$ $\max\alpha = 120^\circ$ $\frac{120}{60} = 2$

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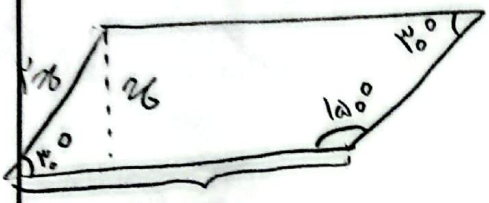


$3x \times x = 54$

$3x^2 = 9 \times 18$

$x = \sqrt{18}$

$3x$

$2 \times \sqrt{18} = 6\sqrt{2}$

$3 \times \sqrt{18} = 9\sqrt{2}$

$P = 2(6\sqrt{2} + 9\sqrt{2}) = 30\sqrt{2}$

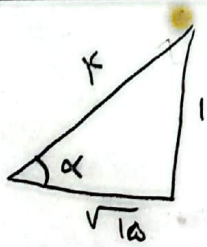
۸

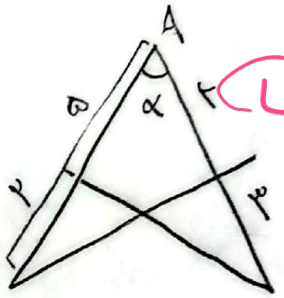
$S_{ABC} = 5 \times 7 \times \sin\alpha$

$S_{ADE} = 4 \times 7 \times \sin\alpha$

$(5 \times 7 \times \sin\alpha) - (4 \times 7 \times \sin\alpha) = 1.75$

$7\sin\alpha (5-4) = 1.75$ $\sin\alpha = 0.25$ $\tan\alpha = \frac{\sqrt{15}}{15}$





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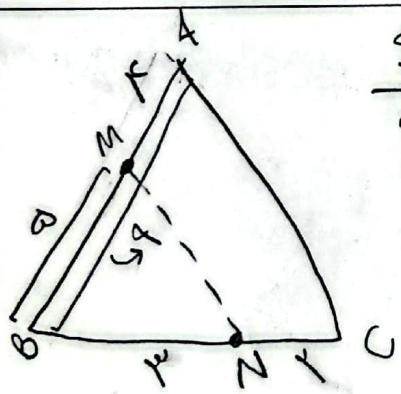

$\frac{S_{ABC}}{S_{BMN}} = \frac{5 \times BA \times \sin B}{3 \times BM \times \sin B} = \frac{3}{1}$ $\frac{5BA}{3BM} = \frac{3}{1}$

$9BM = 5BA$

$9 - 5 = 4$ $\frac{BM}{AM} = \frac{5}{4}$

۱۰

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow |\sin\alpha| = -\sin\alpha \rightarrow \sin\alpha \rightarrow -$ ناحیه سوم

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

1

الف)

$$\tan\frac{11\pi}{4} = \tan(3\pi - \frac{\pi}{4}) = -\tan\frac{\pi}{4} = -1$$
$$\sin\frac{13\pi}{4} = \sin(4\pi - \frac{\pi}{4}) = -\sin\frac{\pi}{4} = -\frac{\sqrt{2}}{2}$$
$$\cos\frac{15\pi}{4} = \cos(3\pi + \frac{\pi}{4}) = -\cos\frac{\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$-1 + (-\frac{\sqrt{2}}{2})^2 = \boxed{-\frac{1}{2}}$$

ب)

$$\tan\frac{17\pi}{4} = \tan(4\pi - \frac{\pi}{4}) = -\tan\frac{\pi}{4} = -\frac{\sqrt{3}}{3}$$
$$\sin\frac{11\pi}{3} = \sin(4\pi - \frac{\pi}{3}) = -\sin\frac{\pi}{3} = -\frac{\sqrt{3}}{2}$$
$$\cos\frac{10\pi}{3} = \cos(3\pi + \frac{\pi}{3}) = -\cos\frac{\pi}{3} = -\frac{1}{2}$$

$$(-\frac{\sqrt{3}}{3})(-\frac{\sqrt{3}}{2}) - \frac{1}{2} = \boxed{0}$$

4_الف

$$\cos^2\alpha = 1 - \sin^2\alpha \rightarrow \cos\alpha = 1 - (\frac{\sqrt{2}}{10})^2 = 1 - \frac{2}{100} = \frac{98}{100} \xrightarrow[\cos\alpha < 0]{\alpha \text{ ناصیه } 2} \cos\alpha = -\frac{7\sqrt{2}}{10}$$

$$\cos(\frac{11\pi}{4} + \alpha) = \cos(3\pi - \frac{\pi}{4} + \alpha) = -\cos(\alpha - \frac{\pi}{4})$$

$$-(\frac{\sqrt{2}}{2} \times \cos\alpha + \frac{\sqrt{2}}{2}\sin\alpha) = -\frac{\sqrt{2}}{2}(-\frac{7\sqrt{2}}{10} + \frac{\sqrt{2}}{10}) = -\frac{1}{\sqrt{2}} \times -\frac{6\sqrt{2}}{10} = \boxed{\frac{3}{5}}$$

4 ب

$$\tan\alpha = \frac{1}{7} \rightarrow 1 + \tan^2\alpha = \frac{1}{\cos^2\alpha} \rightarrow 1 + \frac{1}{49} = \frac{1}{\cos^2\alpha}$$

$$\cos^2\alpha = \frac{49}{50} \xrightarrow[\cos\alpha > 0]{\text{ناصیه اول}} \cos\alpha = \frac{7}{5\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{10}$$

$$\sin^2\alpha = 1 - \frac{49}{50} = \frac{1}{50} \xrightarrow[\sin\alpha > 0]{\text{ناصیه اول}} \sin\alpha = \frac{1}{5\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{10}$$

$$\sin(3\pi + \frac{\pi}{4} + \alpha) = -\sin(\frac{\pi}{4} + \alpha) = -(\frac{\sqrt{2}}{2}\cos\alpha + \frac{\sqrt{2}}{2}\sin\alpha)$$

$$-\frac{\sqrt{2}}{2}(\frac{7\sqrt{2}}{10} + \frac{\sqrt{2}}{10}) = -\frac{1}{\sqrt{2}} \times \frac{8\sqrt{2}}{10} = \boxed{-\frac{4}{5}}$$

5

$$\sin^2\alpha + \underbrace{\sin^2\alpha + \cos^2\alpha}_{1} = \frac{3}{2} \rightarrow \sin^2\alpha = \frac{1}{2}$$

$$\cos^2\alpha = 1 - \frac{1}{2} = \frac{1}{2} \quad , \quad 1 + \tan^2\alpha = \frac{1}{\frac{1}{2}} \rightarrow \tan^2\alpha = 2 - 1 = \boxed{1}$$

8

$$S_{ABC} = \frac{1}{2} \times 7 \times 8 \times \sin\hat{A}$$

$$S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin\hat{A}$$

$\frac{S_{ADE}}{S_{ABC}}$ ←

$$\frac{1}{2} \times 7 \times \sin\hat{A}\,(8-4) = \frac{7}{2}$$

$$\hat{A} = \frac{\pi}{4} \rightarrow \tan\frac{\pi}{4} = \boxed{\frac{\sqrt{3}}{3}}$$