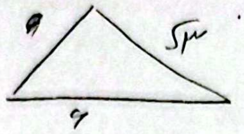
6.

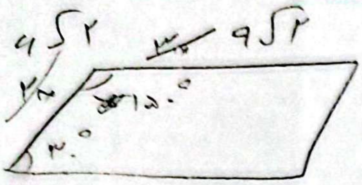
$$\frac{6\times\sqrt{3}\times\sin\alpha}{2}=4.5$$



$$6\sqrt{3}\times\sin\alpha=9$$

$$\sin\alpha=\frac{3}{2\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}=\frac{3\sqrt{3}}{6}=\frac{\sqrt{3}}{2}\quad \alpha=60^\circ$$

7.

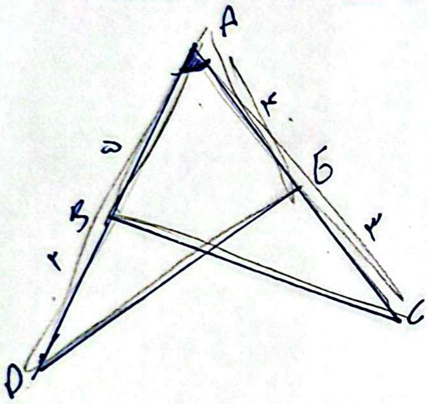


$$2x\cdot 3x\times\sin 150=54$$

$$\sin 150=\frac{1}{2}\qquad 2x\times 3x=108\qquad 6x^2=108\qquad x^2=18\quad x=3\sqrt{2}$$

محیط $=2\times(15\sqrt{2})=30\sqrt{2}$

8.



$$S_{ABC}=5\times7\times\frac{1}{2}\times\sin\hat{A}=\frac{35}{2}\sin\hat{A}$$

$$S_{ADE}=7\times4\times\frac{1}{2}\times\sin\hat{A}=14\sin\hat{A}$$

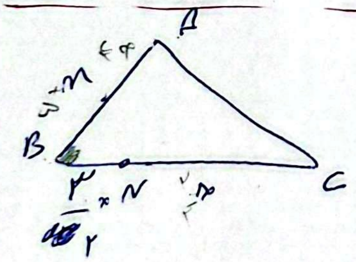
$$\frac{35\sin\hat{A}}{2}-\frac{28\sin\hat{A}}{2}=\frac{175}{100}\qquad \frac{7}{2}\sin\hat{A}=\frac{175}{100}$$

$$\sin\hat{A}=\frac{175}{100}\cdot\frac{2}{7}=\frac{1}{2}$$

$$\boxed{\hat{A}=30^\circ}$$

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

9.



$$S_{ABC}=\frac{1}{2}\times BA\times BC\times\sin\hat{B}=3\left(BM\times\frac{1}{2}\times\frac{3}{5}BC\times\sin\hat{B}\right)$$

$$\frac{1}{2}\times BA\times BC\times\sin B=3BM\times\frac{9BC}{5}\times\frac{3}{2}\times3\sin\hat{B}$$

$$BA\times BC\times\sin B=3BM\times\frac{9BC}{5}\times3\times3\sin\hat{B}$$

$$\frac{BM\times\frac{3BC}{5}\times\sin B}{BA\times BC\times\sin B}=\frac{1}{3}\qquad \frac{BM}{BA}=\frac{5}{9}$$

$$\frac{BM}{AB}=\boxed{\frac{5}{4}}$$

10.

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

$\cos\alpha>0$

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

$\cos\alpha$

آرشید اردشیری

1.

الف)

$\tan\frac{11\pi}{4} = \tan(3\pi - \frac{\pi}{4})$ $\quad \sin\frac{15\pi}{4} = (\sin 4\pi - \frac{\pi}{4})$

$\cos\frac{13\pi}{4} = \cos(3\pi + \frac{\pi}{4})$

$-\tan(\frac{\pi}{4}) - \sin(\frac{\pi}{4}) + \cos(\frac{\pi}{4}) = \frac{-\sin(\frac{\pi}{4})}{\cos(\frac{\pi}{4})} - \frac{\sin\cos(\frac{\pi}{4})}{\cos(\frac{\pi}{4})\frac{\sqrt2}{2}} - \frac{\cos^2(\frac{\pi}{4})}{\cos(\frac{\pi}{4})}$

$-1 - \frac{2}{2\sqrt2}\cdot\frac{\sqrt2}{\sqrt2} - \frac{\sqrt2}{2}$

$-\frac{2}{2} - \frac{2\sqrt2}{4} - \frac{\sqrt2}{2} = \frac{-2-2\sqrt2}{2}$

ب)

$\tan\frac{17}{6}\pi = \tan(3\pi - \frac{\pi}{6}) = -\tan(\frac{\pi}{6}) = -\frac{1}{\sqrt3}$

$\sin\frac{11\pi}{3} = \sin(4\pi - \frac{\pi}{3}) = -\sin(\frac{\pi}{3}) = -\frac{\sqrt3}{2}$

$\cos\frac{10\pi}{3} = \cos(3\pi + \frac{\pi}{3}) = -\cos(\frac{\pi}{3}) = -\frac{1}{2}$

$-\frac{1}{\sqrt3} \times (-\frac{\sqrt3}{2}) = \frac{1}{2}$ $\quad \frac12 - \frac12 = \boxed{0}$

2.

$\frac{\cos}{\sin} = 4$ $\quad \cos = 4k,\ \sin = k$ $\quad \frac{3(4k) - k}{4k + k} = \frac{11k}{5k} = \frac{11}{5}$

3.

$\sin\alpha < 0$, $\cos\alpha < 0$ $\quad \sin\alpha\cos\alpha \Rightarrow 225 < \alpha < 270$

$-\frac{\sqrt2}{2} < \cos\alpha < 0$

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4. الف)

$\begin{cases}\sin\alpha > 0 \\ \cos\alpha < 0\end{cases}$ ناحیه ۲

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

$= -\cos(45°)$

$-\frac{\sqrt2}{2} + \cos(\alpha) = \boxed{-\frac{\sqrt2}{2} + \frac{7}{5\sqrt2}}$

$\sin^2\alpha + \cos^2\alpha = 1$

$\frac{1}{50} + \cos^2\alpha = \frac{50}{50}$ $\quad \frac{49}{50} = \cos^2\alpha$ $\quad \cos = \frac{7}{\sqrt{50}} = \boxed{\frac{7}{5\sqrt2}}$

5.

$2\sin^2 + 1 - \sin^2 = \frac{4}{3}$

$\sin^2 + \frac{3}{3} = \frac{4}{3}$ $\quad \sin^2 = \frac{1}{3}$ $\quad \boxed{\sin = \frac{1}{\sqrt3}}$

$\sin^2 + \cos^2 = 1$

$\frac{1}{3} + \cos^2 = \frac{3}{3}$ $\quad \boxed{\cos = \frac{\sqrt2}{\sqrt3}}$

$\tan^2 = \frac{\sin^2}{\cos^2} = \frac{\frac13}{\frac23} = \frac{1}{2}$