الف) $S = ab\sin\alpha \to 3\times4\times\frac{\sqrt3}{2} = 6\sqrt3$ ۶

ب) $S = \frac12 ab\sin\alpha = \frac12\times3\times4\times\frac{\sqrt3}{2} = 3\sqrt3$

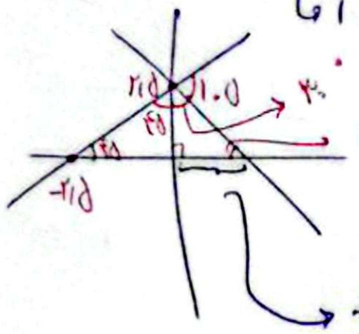
$\tan\theta = \frac{y_2-y_1}{x_2-x_1} = \frac{2}{4} = \frac{1}{2} \to 1+\tan^2 = \frac{1}{\cos^2} \to \frac{5}{4} = \frac{1}{\cos^2}$ ۷

$\to \cos^2 = \frac{4}{5} \to \cos = \frac{2}{\sqrt5}\times\frac{\sqrt5}{\sqrt5} = \frac{2\sqrt5}{5}$

$2y = 2x+5 \to y = x+2.5 \to 2.5 =$ عرض از مبدا ۸

if $y=0 \to 0 = x+2.5 \to x = -2.5$ ، طول از مبدا

مشابه اول تمرین
به زاویه ۴۵°



$y = mx+b \to b = 2.5$ عرض از مبدا

$\sin 60^\circ = \frac{\sqrt3}{2} = \frac{2.5}{\text{وتر}} \to \text{وتر} = \frac{5\sqrt3}{3}$

نصف وتر $\to \frac{5\sqrt3}{3}\times\frac{1}{2} = \frac{5\sqrt3}{6}$

$m =$ شیب خط $= \frac{y_2-y_1}{x_2-x_1} = \frac{2.5-0}{0-\frac{5\sqrt3}{6}} \to \frac{\frac{25}{10}}{-\frac{5\sqrt3}{6}} = \frac{6\times25}{-5\sqrt3\times10} = -\frac{3}{\sqrt3} = \frac{3\sqrt3}{3} = -\sqrt3$

$mb = -\sqrt3\times\frac{25}{10} = \frac{-25\sqrt3}{10} = -\frac{5\sqrt3}{2}$

$f\left(\frac{5\pi}{6}\right) = \cos\left(\pi+\frac{5\pi}{6}\right) + \sin\left(\frac{\pi}{2}-\frac{5\pi}{6}\right) - \tan\left(\frac{3\pi}{2}+\frac{5\pi}{6}\right)$ ۹

$\cos\frac{5\pi}{6} + \left(-\cos\frac{5\pi}{6}\right) - \left(\cot\frac{5\pi}{6}\right) = -\cot\frac{5\pi}{6} = -\frac{-\frac{\sqrt3}{2}}{\frac{1}{2}} = \sqrt3$

$\frac{\sin\left(\frac{17\pi}{2}+x\right)+\cos\left(\frac{15\pi}{2}-x\right)}{\cos(3\pi+x)-\sin(9\pi-x)} = \frac{\cos x - \sin x}{-\cos x - (-\sin x)} = \frac{-(\sin x - \cos x)}{\sin x - \cos x}$ ۱۰

$= -1$

به نام خدا

مهدی موسوی

1

الف) $(\sin 135^\circ + \sin 300^\circ)(\cos 315^\circ - \cos 150^\circ) \to \left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{3}}{2}\right)\right)\left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{3}}{2}\right)\right) \Rightarrow$

$\frac{\sqrt{2}-\sqrt{3}}{2} \times \frac{\sqrt{2}+\sqrt{3}}{2} = \frac{2-3}{2} = -\frac{1}{2}$

ب) $\frac{1 + 3\tan^2 210^\circ}{4\cos^2 330^\circ + 2\cos^2 225^\circ} = \frac{1 + \left(3\times\left(\frac{\sqrt{3}}{3}\right)^2\right)}{\left(4\times\left(\frac{\sqrt{3}}{2}\right)^2\right) + \left(2\times\left(\frac{\sqrt{2}}{2}\right)^2\right)} = \frac{2}{3+1} = \frac{1}{2}$

2

الف) $\hat{B} = 45^\circ$, $\hat{A}_1 = 45^\circ \to$ متساوی الساقین $\to \underbrace{AH}_{a}^2 + \underbrace{BH}_{a}^2 = 6 \to 2a^2 = 6 \to a = \sqrt{3} = BH = AH$

$AH^2 + HC^2 = 12 \to 3 + HC^2 = 12 \to HC^2 = 9 \to HC = 3$

ب) $\hat{A}_1 = 60^\circ \to \hat{C} = 30^\circ \to \cos 30^\circ = \frac{\sqrt{3}}{2} = \frac{9}{AC} \to AC = 6\sqrt{3} \to (6\sqrt{3})^2 = 9^2 + AH^2$

$\to AH = 3\sqrt{3} \to AB^2 = AH^2 + BH^2 \to 54 = 27 + BH^2 \to BH^2 = 27 \to BH = 3\sqrt{3}$

مثلث متساوی الساقین با یک زاویه قائمه ← پس دو زاویه دیگر 45° می باشد ← $\hat{B} = 45^\circ$

3

الف) $AC = (2)(50\sqrt{3}) = 100\sqrt{3}$, $AD = \left(\frac{2}{\sqrt{3}}\right)(50\sqrt{3}) = 100$

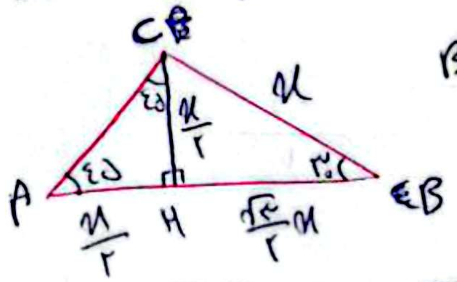
$AB^2 + BC^2 = AC^2 \to 30000 = 7500 + BC^2 \to BC^2 = 22500 \to BC = 150$

$AD^2 = AB^2 + BD^2 \to 10000 = 7500 + BD^2 \to BD = 50 \to x = 150 - 50 = 100$

ب) $AC = 2(1+1) = 4 \to AB^2 + BC^2 = AC^2 \to 16 = 4 + BC^2 \to BC = 2\sqrt{3}$

$BC^2 + BD^2 = DC^2 \to 1^2 + 12 = DC^2 \to DC = \sqrt{13} \to \sin\alpha = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

4



$BH^2 + \frac{x^2}{4} = x^2 \to BH^2 = \frac{3x^2}{4} \to BH = \frac{\sqrt{3}}{2}x$

$CH^2 + AH^2 = AC^2 \to \frac{x^2}{4} + \frac{x^2}{4} \to \frac{2x^2}{4} \to AC = \frac{\sqrt{2}x}{2}$

$\frac{AB}{AC} \to \frac{\frac{\sqrt{3}x}{2} + \frac{x}{2}}{\frac{\sqrt{2}x}{2}} \to \frac{\frac{x(1+\sqrt{3})}{\cancel{2}}}{\frac{\sqrt{2}x}{\cancel{2}}} \to \frac{x(1+\sqrt{3})}{\sqrt{2}x} \times \frac{\sqrt{2}}{\sqrt{2}}$

$\Rightarrow \frac{\sqrt{2}+\sqrt{6}}{2}$

5

$\hat{B}_1 = \hat{B}_2$ متقابل $\to \sin\hat{B}_1 \times \frac{1}{2} \times 2 \times 4 = S_{ABE}$

$\sin B_2 \times \frac{1}{2} \times 6 \times 3 = S_{CDB}$

$\frac{S_{ABE}}{S_{BCD}} = \frac{\cancel{\sin B_1} \times \cancel{\frac{1}{2}} \times \cancel{2} \times 4}{\cancel{\sin B_2} \times \cancel{\frac{1}{2}} \times \cancel{6}_{3} \times 3} = \frac{4}{9}$