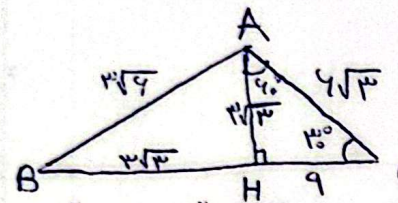
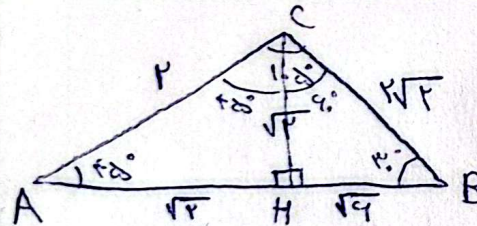


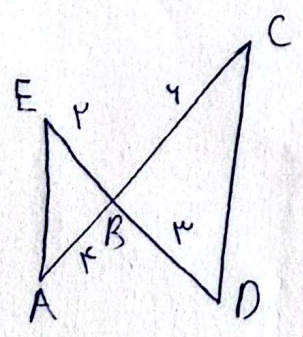
(الف) $(\sin 135^\circ + \sin 30^\circ)(\cos 135^\circ - \cos 150^\circ)$
 $(\frac{\sqrt{2}}{2} + (-\frac{\sqrt{3}}{2}))(\frac{\sqrt{2}}{2} - (-\frac{\sqrt{3}}{2})) \Rightarrow \frac{\sqrt{2}-\sqrt{3}}{2} \times \frac{\sqrt{2}+\sqrt{3}}{2} = \frac{2-3}{4} = -\frac{1}{4}$

(ب) $\frac{1 + 3 \tan^2 110^\circ}{\cos^2 110^\circ + \cos^2 118^\circ} = \frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}} = \frac{1}{3} \times 3 = 1 \Rightarrow 1+1=2$
 $\frac{\sqrt{3}}{1} \times \frac{\sqrt{3}}{1} = 3 \times 1 = 3$
 $-\frac{\sqrt{2}}{2} \times (-\frac{\sqrt{2}}{2}) = \frac{2}{4} \Rightarrow 2 \times \frac{2}{4} = 1 \Rightarrow 2+1=3$ $\frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}}$

(الف) $AH = BH = \sqrt{3}$
 $\sqrt{3} + \sqrt{3} = \sqrt{12}$
 $(\sqrt{3})^2 = (\sqrt{3})^2 + HC^2 \Rightarrow HC = \sqrt{9} = 3$

 $\frac{\sqrt{3}}{2} \times 3 = 9 \Rightarrow 9 \times \frac{2}{\sqrt{3}} = \frac{18}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 6\sqrt{3}$
 $AH^2 + 9^2 = (4\sqrt{3})^2 \Rightarrow AH = 3\sqrt{3}$
 $(3\sqrt{3})^2 = (3\sqrt{3})^2 + BH^2 \Rightarrow BH = 3\sqrt{3}$

(الف) $20\sqrt{3} \times 2 = 100\sqrt{3}$
 $BC^2 + (20\sqrt{3})^2 = (100\sqrt{3})^2 \Rightarrow BC = \sqrt{22500} = 150$
 $20\sqrt{3} \times \frac{2}{\sqrt{3}} = 100$
 $BD^2 + (20\sqrt{3})^2 = 100^2 \Rightarrow BD = 20$
 $AB^2 + BC^2 = AC^2$
 $2^2 + 2^2 = 2^2 \Rightarrow BC = 2\sqrt{2}$
 $2^2 + BC^2 = 2^2 \Rightarrow BC = 0$
 $DC = \sqrt{100} = 10$
 $DC = \sqrt{100} = 10$
 $\sin \alpha = \frac{1}{\sqrt{10}}$
 $x = 150 - 50 = 100$

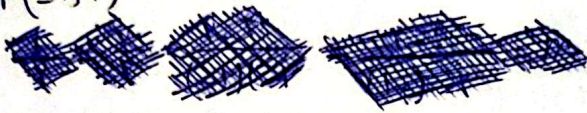
(الف) $\sin 45^\circ = \frac{\sqrt{2}}{2}$

 $\sin 45^\circ = \frac{1}{2}$
 $\frac{1}{2} = \frac{\sqrt{2}}{2\sqrt{2}} \Rightarrow BC = 2\sqrt{2}$
 $HB^2 + (\sqrt{2})^2 = (2\sqrt{2})^2 \Rightarrow HB = \sqrt{6}$
 $AH = \sqrt{2}$
 $\frac{AB}{AC} = \frac{\sqrt{2} + \sqrt{6}}{2}$

(الف) $\frac{1}{2} \times 2 \times 2 \times \sin B = \frac{2}{9}$


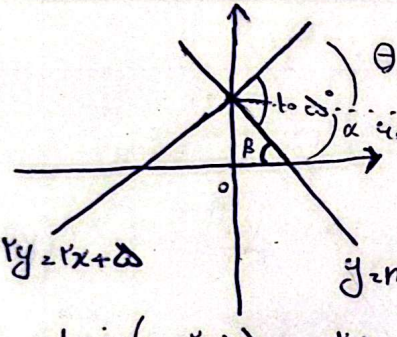
الف) $\frac{1}{r} \times r \times r \times \sin 120^\circ = \frac{1}{r} \times r \times r \times \frac{\sqrt{3}}{2} = \frac{r^2 \sqrt{3}}{r} = r\sqrt{3} \Rightarrow r\sqrt{3} \times r = \boxed{9\sqrt{3}}$
 $S = \frac{1}{r} ab \sin \alpha$
 ب) $S = \frac{1}{r} ab \sin \alpha \Rightarrow \frac{1}{r} \times r \times r \times \frac{\sqrt{3}}{2} = \boxed{3\sqrt{3}}$

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$Q(3, 4), P(-1, 2)$

سبب خط:  $\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{3 - (-1)} = \frac{2}{4} = \frac{1}{2}$
 $\tan \theta = \frac{1}{2}$
 $\cos \theta = \frac{1}{\sqrt{\tan^2 \theta + 1}} = \frac{1}{\sqrt{\frac{1}{4} + 1}} = \frac{2}{\sqrt{5}}$

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 $\theta = 42^\circ \quad \theta + \alpha = 108^\circ$
 $y = 2x + 2 \Rightarrow y = x + 2$
 $\tan \theta = 1 \Rightarrow \theta = 45^\circ$
 $108^\circ - 45^\circ = 63^\circ$
 $\alpha = \beta \Rightarrow \beta = 42^\circ \Rightarrow \tan 42^\circ = \sqrt{3}$
 $m = \sqrt{3}$
 $y_1 = \sqrt{3}(0) + b \Rightarrow b = 2, y_1 = 2 \quad \boxed{mb = 2, \Delta \sqrt{3}}$

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$f(x) = \cos(\pi + x) + \sin(\frac{\pi}{4} - x) - \tan(\frac{\pi}{4} + x)$
 $= -\cos x + \cos x - (-\cot x) = \cot x$

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$f(\frac{\Delta \pi}{4}) = f(120^\circ)$
 $\cot 120^\circ = \frac{-\frac{\sqrt{3}}{2}}{+\frac{1}{2}} = -\frac{\sqrt{3}}{1} = \boxed{-\sqrt{3}}$

$\frac{\sin(\frac{14\pi}{5} + x) + \cos(\frac{12\pi}{5} - x)}{\cos(7\pi + x) - \sin(4\pi - x)} = \frac{\cos x + (-\sin x)}{-\cos x + \sin x}$
 $= \frac{\cos x - \sin x}{-\cos x + \sin x} = \frac{\cos x - \sin x}{-(\cos x - \sin x)} = \boxed{-1}$

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