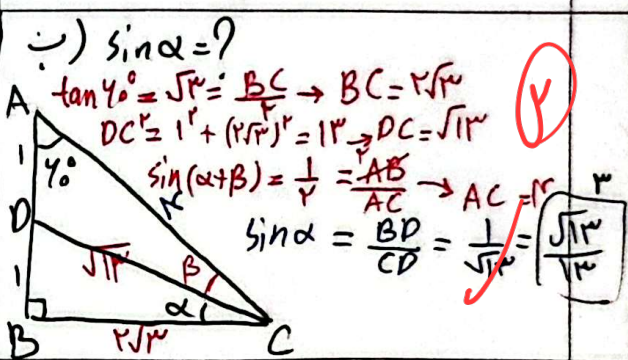
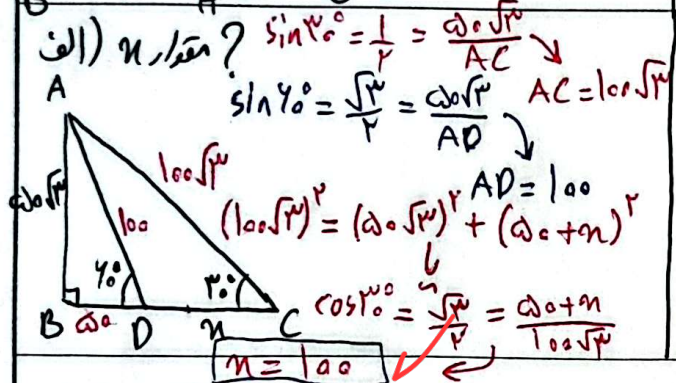
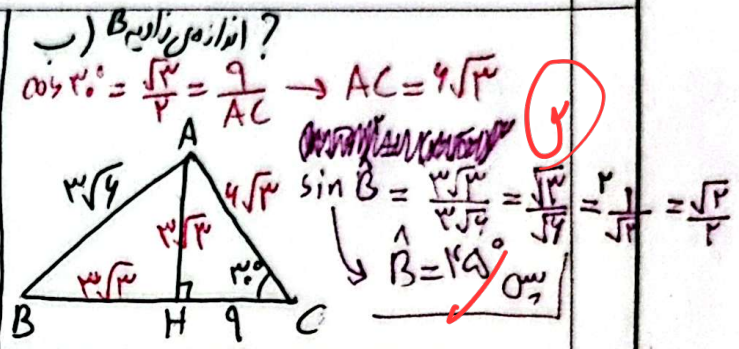
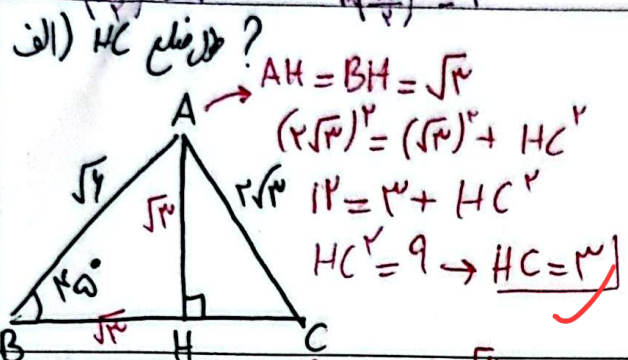


الف) $(\sin 135^\circ + \sin 225^\circ)(\cos 135^\circ - \cos 15^\circ) = \left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{2}}{2}\right)\right)\left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{2}}{2}\right)\right) =$

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

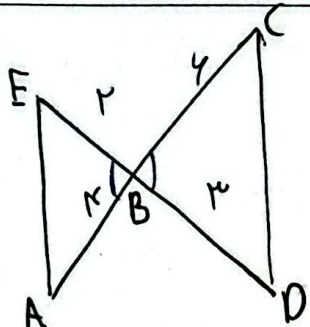
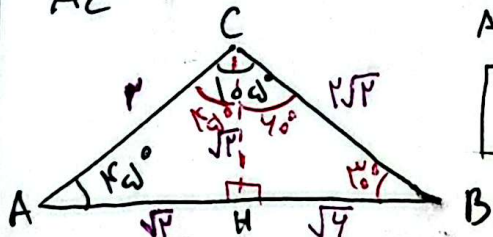
ب) $1 + 3 \tan^2 45^\circ = 1 \times \left(\frac{\sqrt{3}}{3}\right)^2 = 1$
 $\frac{1 + 3 \tan^2 45^\circ + 3 \cos^2 45^\circ}{3 \cos^2 45^\circ} = \frac{1+1}{3+1} = \frac{2}{4} = \frac{1}{2}$ ✓



$\frac{AB}{AC} = ?$

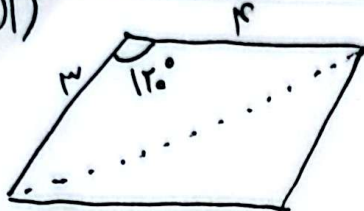
$AB = \sqrt{2} + \sqrt{2}$
 $AC = 2$

$\boxed{\frac{AB}{AC} = \frac{\sqrt{2} + \sqrt{2}}{2}}$ ✓



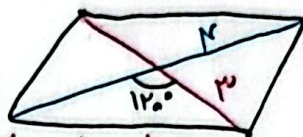
$\frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{\frac{1}{2} \times 1 \times 2 \times \sin B}{\frac{1}{2} \times 4 \times 2 \times \sin B} = \boxed{\frac{1}{4}}$ ✓

الف)



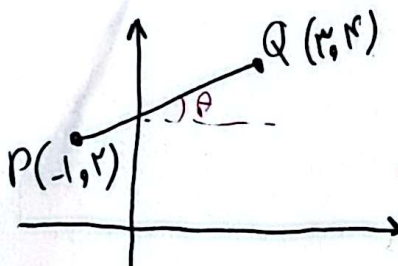
$$S = \frac{1}{2} \times 3 \times 4 \times \sin 120^\circ = \frac{1}{2} \times 3 \times 4 \times \frac{\sqrt{3}}{2} = 3\sqrt{3}$$

ب) (۳ و ۴ طول کل قطرها است)



$$S = \frac{1}{4} ab \sin \alpha = \frac{1}{4} \times 3 \times 4 \times \frac{\sqrt{3}}{2} = 3\sqrt{3}$$

$\cos \theta = ?$

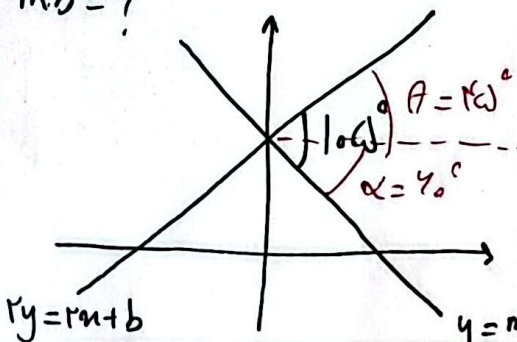


$$\text{شیب خط} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{2 - (-1)} = \frac{2}{3} = \frac{1}{\frac{3}{2}}$$

$$\tan A = \frac{1}{\frac{3}{2}}$$

$$\cos A = \frac{1}{\sqrt{\tan^2 + 1}} = \frac{1}{\sqrt{\frac{1}{9} + 1}} = \frac{3}{\sqrt{10}}$$

$mb = ?$



$$\theta + \alpha = 105^\circ$$

$$y = mx + b \rightarrow y = x + 1$$

$$\tan \theta = 1 \rightarrow \theta = 45^\circ$$

$$105 - 45 = 60$$

$$\alpha = \beta \rightarrow \beta = 60^\circ \rightarrow \tan 60^\circ = \sqrt{3}$$

$$m = \sqrt{3}$$

$$y = mx + b, 1 = \sqrt{3}(0) + b \rightarrow b = 1$$

$$mb = \sqrt{3} \times 1 = \sqrt{3}$$

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

$$f(\frac{5\pi}{4}) = ? \quad -\cos n + \cos n - (-\cot n) = \cot n$$

$$\rightarrow f(135^\circ) = \cot(135^\circ) = -1$$

$$\frac{\sin(\frac{14\pi}{5} + n) + \cos(\frac{14\pi}{5} - n)}{\cos(3\pi + n) - \sin(4\pi - n)} = \frac{\cos n + (-\sin n)}{-\cos n + \sin n}$$

$$= \frac{\cos n - \sin n}{-\cos n + \sin n} = \frac{\cos n - \sin n}{-(\cos n - \sin n)} = -1$$