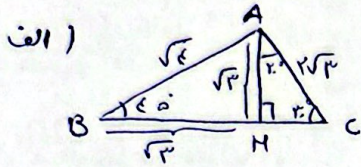


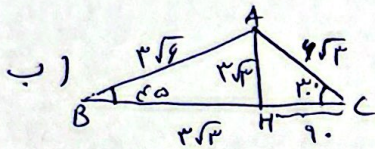
نام زنام خانواری: رها موسوی مدنی - تلفن: ۲۰۰

الف) $(\sin 135^\circ + \sin 45^\circ)(\cos 135^\circ - \cos 45^\circ) = \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\right) = \frac{1}{2} - \frac{2}{2} = -\frac{1}{2}$

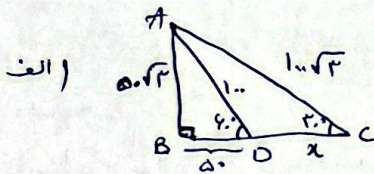
ب) $\frac{1 + 3\cos^2 45^\circ}{4\cos^2 45^\circ + 2\cos^2 135^\circ} = \frac{1 + 3\left(\frac{\sqrt{2}}{2}\right)^2}{4\left(\frac{\sqrt{2}}{2}\right)^2 + 2\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1+1}{2+1} = \frac{2}{3}$



$HC = \sqrt{2} \times \frac{\sqrt{2}}{2} = 1$



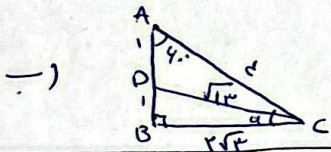
$\hat{B} = 45^\circ$



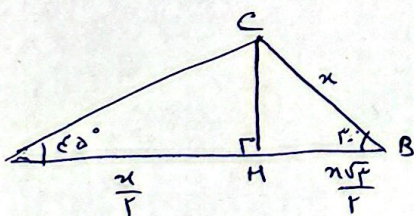
$BC = 1 \cdot \sqrt{2} \times \frac{\sqrt{2}}{2} = 1$

$BC = BD + DC = x + 1 - x = 1$

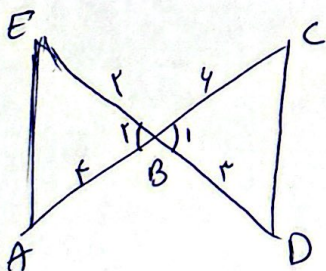
$x = 1$



$\sin \alpha = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$



$AC = \sqrt{\frac{x^2}{r^2} + r^2} = \frac{x}{r} \sqrt{r^2 + 1}$
 $AB = \frac{x}{r} + \frac{x\sqrt{r^2 + 1}}{r} = \frac{x(1 + \sqrt{r^2 + 1})}{r}$
 $\frac{AB}{AC} = \frac{x(1 + \sqrt{r^2 + 1})}{r} \times \frac{r}{x\sqrt{r^2 + 1}} = \frac{1 + \sqrt{r^2 + 1}}{\sqrt{r^2 + 1}}$



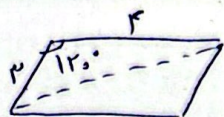
$B_1 = B_2 \rightarrow \sin B_1 = \sin B_2$

$S_{\triangle ABE} = \frac{1}{2} \times f \times f \times \sin B_2 = f^2 \sin B_2$

$S_{\triangle CDE} = \frac{1}{2} \times 9 \times 9 \times \sin B_1 = 9^2 \sin B_1$

$\frac{S_{\triangle ABE}}{S_{\triangle CDE}} = \frac{f^2 \sin B_2}{9^2 \sin B_1} = \frac{f^2}{9^2}$

الف)



$$r \times \frac{1}{r} \times r \times r \sin 120^\circ = 1 \times r \times \sqrt{\frac{r}{r}} = \boxed{4\sqrt{r}}$$

ب)



$$\frac{1}{r} \times r \times r \times r \sin 120^\circ = 4 \sin 120^\circ = \boxed{3\sqrt{r}}$$

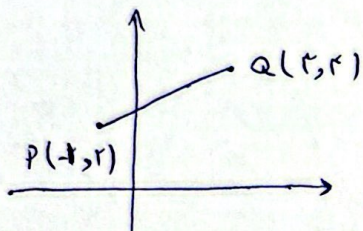
4

V

1

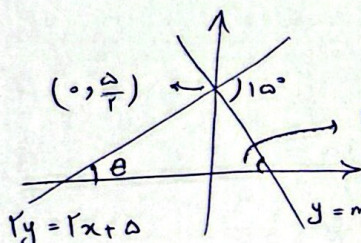
9

10



$$a = \frac{r-r}{r-(-1)} = \frac{1}{r} \Rightarrow \tan \theta = \frac{1}{r} \Rightarrow \cos \theta = \sqrt{\frac{1}{1+\tan^2 \theta}}$$

$$\frac{r}{\sqrt{a}} = \frac{r\sqrt{a}}{a}$$



$$b-a = \epsilon a = 40^\circ \rightarrow \tan 12^\circ = \frac{-\sqrt{r} \cdot m}{r}$$

$$\boxed{b = \frac{a}{r}}$$

$$\Rightarrow \boxed{mb = -\frac{a\sqrt{r}}{r}}$$

$$\hookrightarrow y = x + \frac{a}{r} \rightarrow \tan \theta = 1 \rightarrow \theta = 45^\circ \checkmark$$

$$\rightarrow \theta = 120^\circ \text{ بين الخطين (مستقيمات متوازيات)}$$

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

$$f\left(\frac{a\pi}{r}\right) = \cot 120^\circ = \boxed{-\frac{1}{\sqrt{3}}}$$

$$\frac{\sin\left(\frac{14\pi}{r} + x\right) + \cos\left(\frac{14\pi}{r} - x\right)}{\cos(r\pi - x) - \sin(4\pi - x)} = \frac{\cos x - \sin x}{-\cos x + \sin x} = -1$$