

(الف) $(\sin 15^\circ + \sin 30^\circ)(\cos 15^\circ - \cos 15^\circ)$

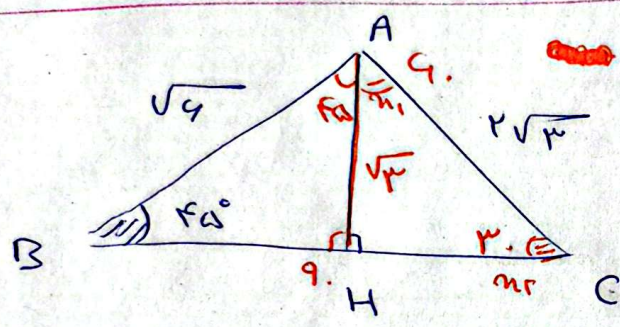
$$\left(\frac{\sqrt{2}}{2} + \frac{1}{2} \right) \left(\frac{\sqrt{2}-\sqrt{2}}{2} \right) = \frac{\sqrt{2}-\sqrt{2}}{2} = 0$$

(ب) $1 + \tan^2 15^\circ = \frac{1}{\cos^2 15^\circ}$

$\frac{1}{\cos^2 15^\circ} = 1 + \tan^2 15^\circ$

$$\frac{1}{\cos^2 15^\circ} = 1 + \frac{\sin^2 15^\circ}{\cos^2 15^\circ}$$

$$\frac{1}{\cos^2 15^\circ} = \frac{\cos^2 15^\circ + \sin^2 15^\circ}{\cos^2 15^\circ} = \frac{1}{\cos^2 15^\circ}$$

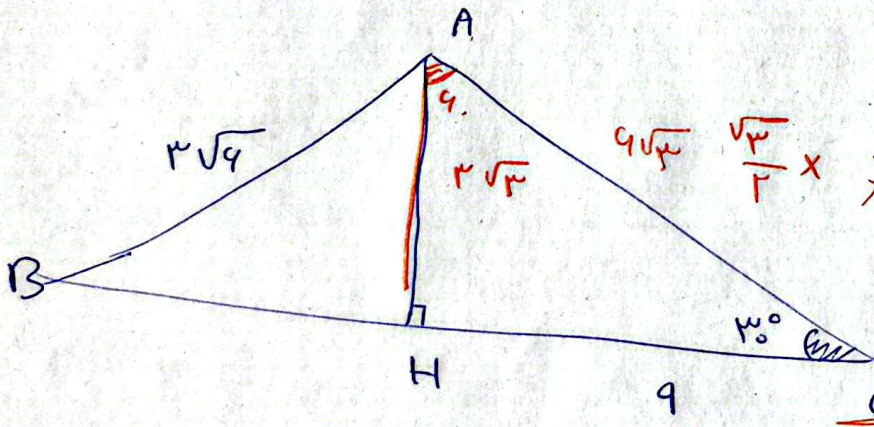


الف) طول HC

$$\frac{\sqrt{2}}{2} \times \sqrt{4} = \frac{\sqrt{2}}{2} \times 2 = \sqrt{2}$$

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

$$\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{2}{4} = \frac{1}{2}$$

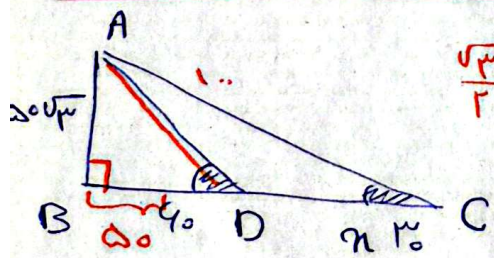


(ب) اندازه زاویه B

$$\frac{\sqrt{3}}{2} \times \frac{4\sqrt{3}}{2} = 9$$

$\sin B = \frac{2\sqrt{3}}{4\sqrt{2}}$

$\frac{C}{45^\circ} = B$



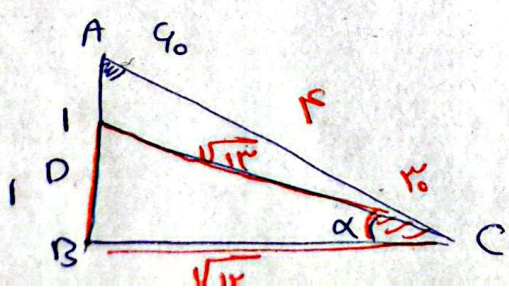
$\frac{\sqrt{3}}{2} \times AD = 50\sqrt{3}$

$AD = 100$

$$\frac{50 + x}{50\sqrt{3}} = \frac{\sqrt{3}}{2}$$

$150 = 100 + 2x$

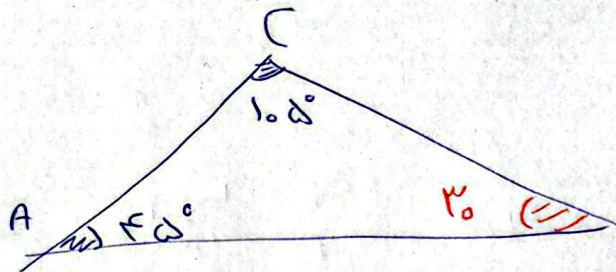
$x = 25$



$$\frac{1}{\sqrt{13}} \times \frac{\sqrt{13}}{\sqrt{13}} = \frac{\sqrt{13}}{13}$$

$\sin \alpha$

$$\sin 10^\circ = \sin 70^\circ = \frac{1 - \cos 80^\circ}{2} \quad \text{باستخدام قانون جيبس}$$



$$\frac{1 + \sqrt{r}}{r} = \frac{r + \sqrt{r}}{r}$$

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

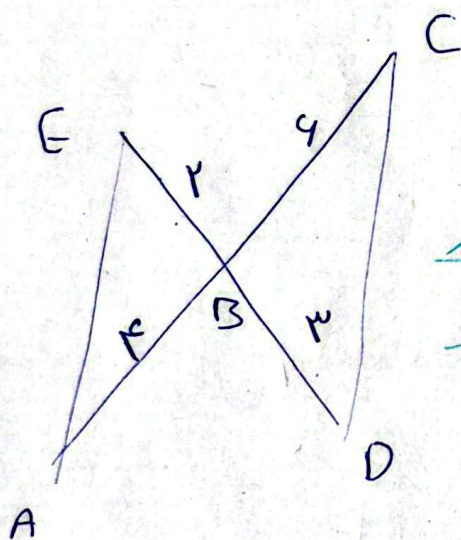
$$\sin = \frac{\sqrt{r + \sqrt{r}}}{r}$$

$$\frac{AB}{\sin 10^\circ} = \frac{AC}{\sin 70^\circ}$$

$$AB \times \sin 70^\circ = AC \times \sin 10^\circ$$

$$\frac{AB}{AC} = \frac{\sin 10^\circ}{\sin 70^\circ}$$

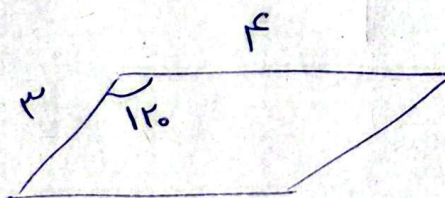
$$\frac{\sqrt{r + \sqrt{r}}}{r}$$



$$\frac{S_{\triangle ABE}}{S_{\triangle BCD}}$$

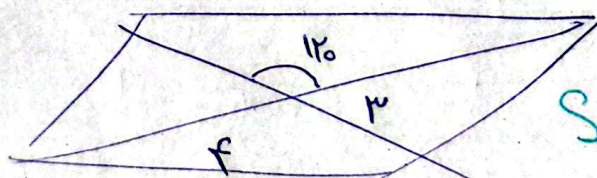
نسبت مساحتين - 8

$$\frac{\frac{1}{2} \times r \times q \times \sin \alpha}{\frac{1}{2} \times r \times q \times \sin \alpha} = \frac{r}{q}$$



$$r \times r_0 \times \sin 110^\circ = \frac{\sqrt{r}}{r}$$

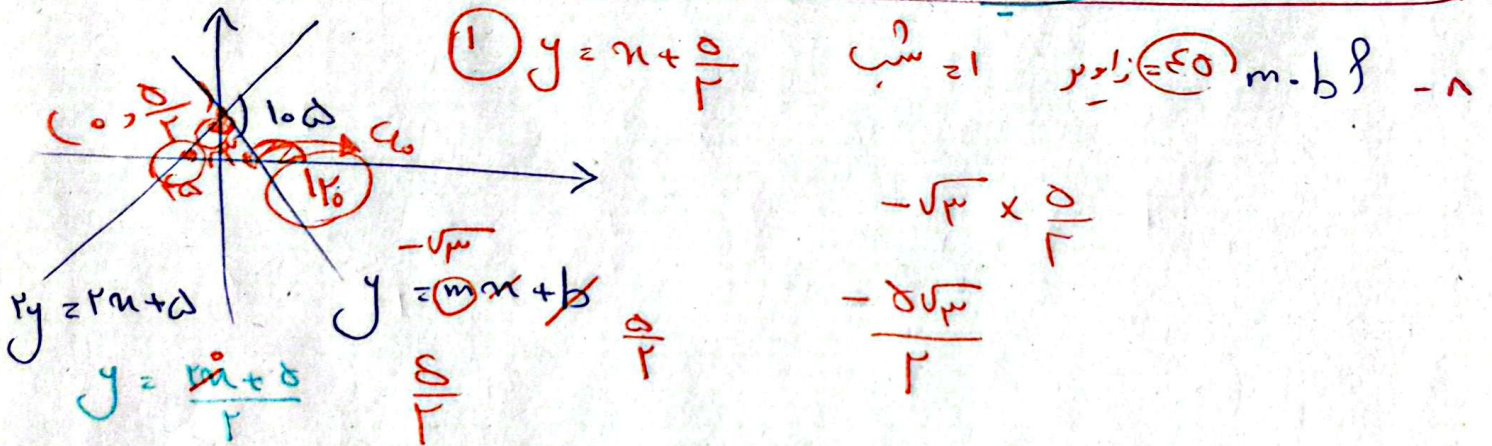
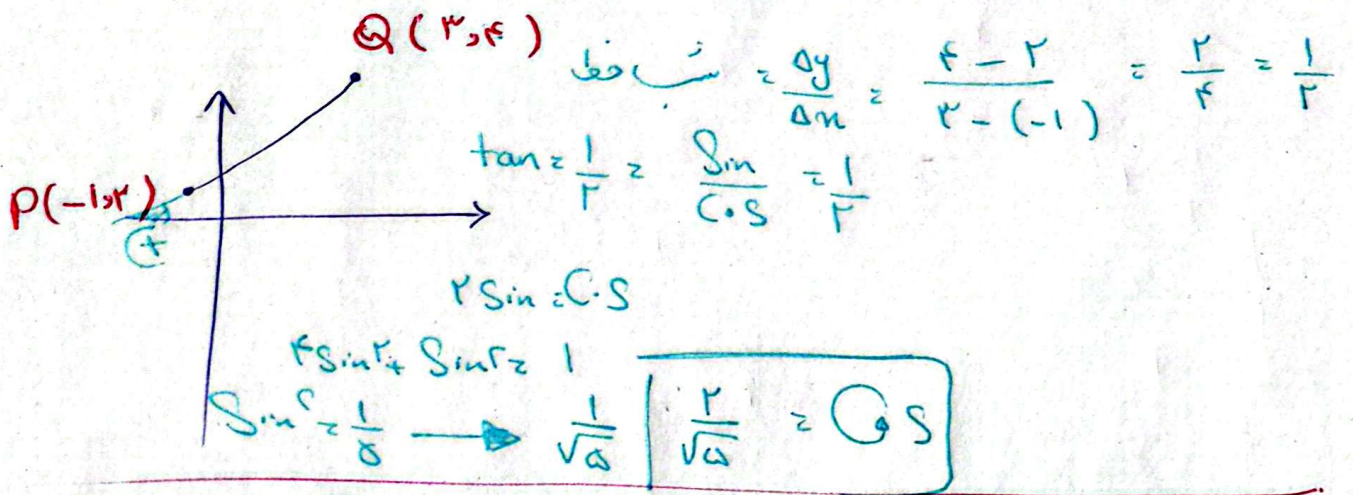
(ب)



$$S = \frac{1}{2} \times r \times r \times \sin 110^\circ$$

(ج)

v- اگر خط گذرا از نقاط P و Q با محور m زاویه θ بسازد $\cos \theta$ را بیابید



$f\left(\frac{\alpha}{4}\right)$
 $f(n) = \cos\left(\frac{\alpha}{4} + n\right) + \sin\left(\frac{\alpha}{4} - n\right) - \tan\left(\frac{\alpha}{4} + n\right)$
 $\cos + \sin - \tan$
 $\cos(18.0^\circ) = \frac{\sqrt{2}}{2}$
 $\sin = \frac{1}{2}$
 $\tan = 1$

$$\frac{1}{\sin \frac{10\pi}{7} + n} \left(\cos \left(\frac{10\pi}{7} - n \right) - \sin \left(4\pi - n \right) \right) - \cos \left(\frac{10\pi}{7} + n \right) + \sin \left(4\pi - n \right)$$