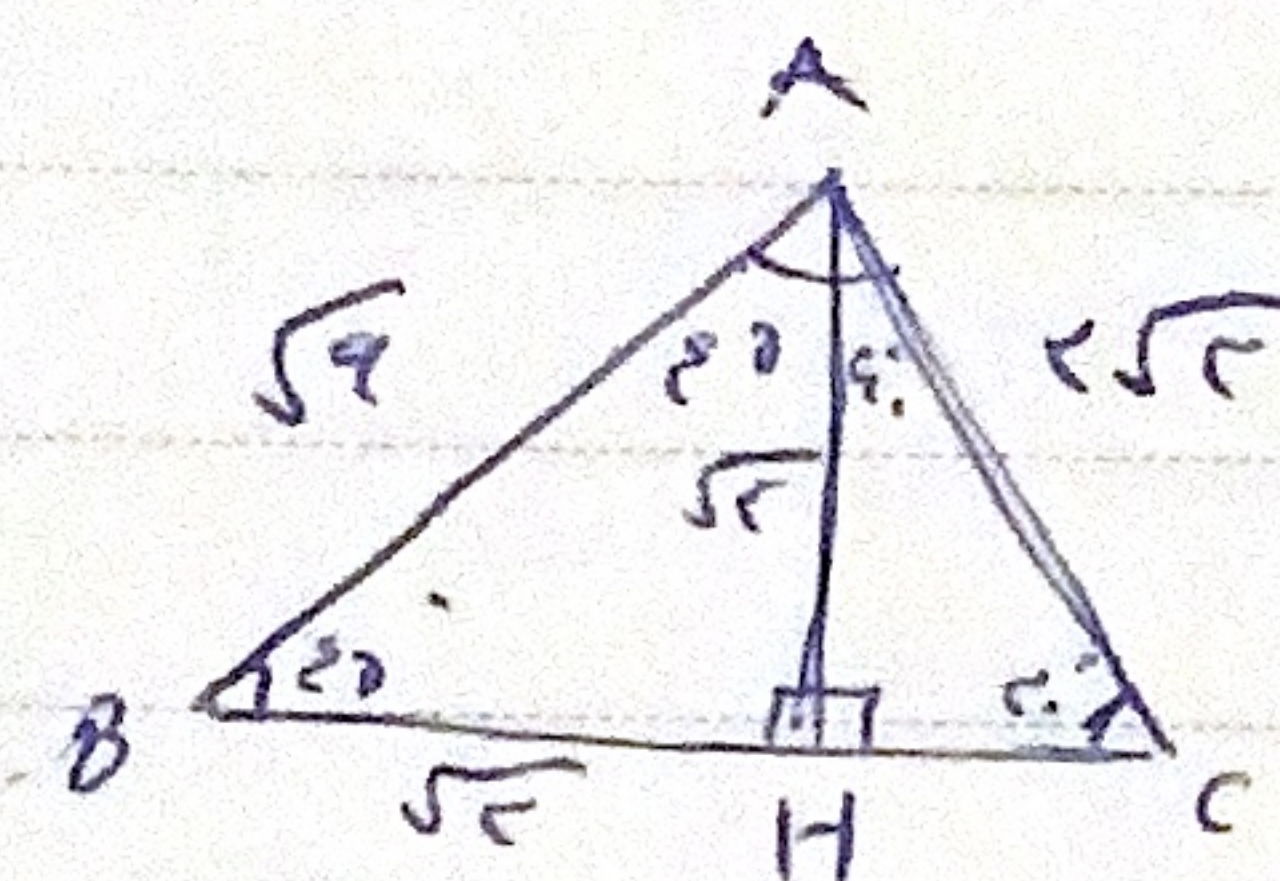


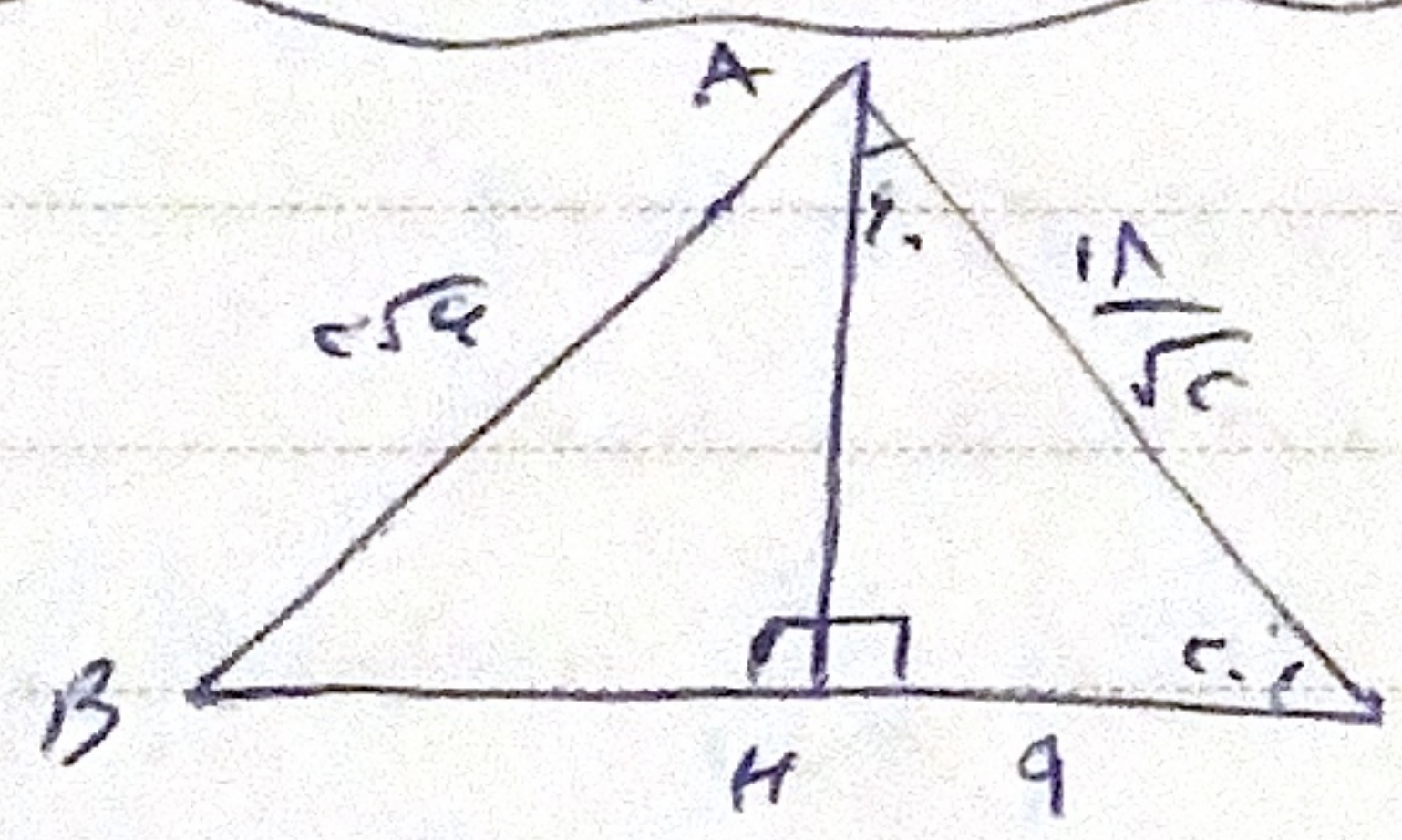
الف)  $\sin x \cos y + \sin y \cos x = \frac{\sqrt{2}}{2} \left( \frac{\sqrt{2}}{2} + (-\frac{\sqrt{2}}{2}) \right) \left( \frac{\sqrt{2}}{2} - (-\frac{\sqrt{2}}{2}) \right)$  -1

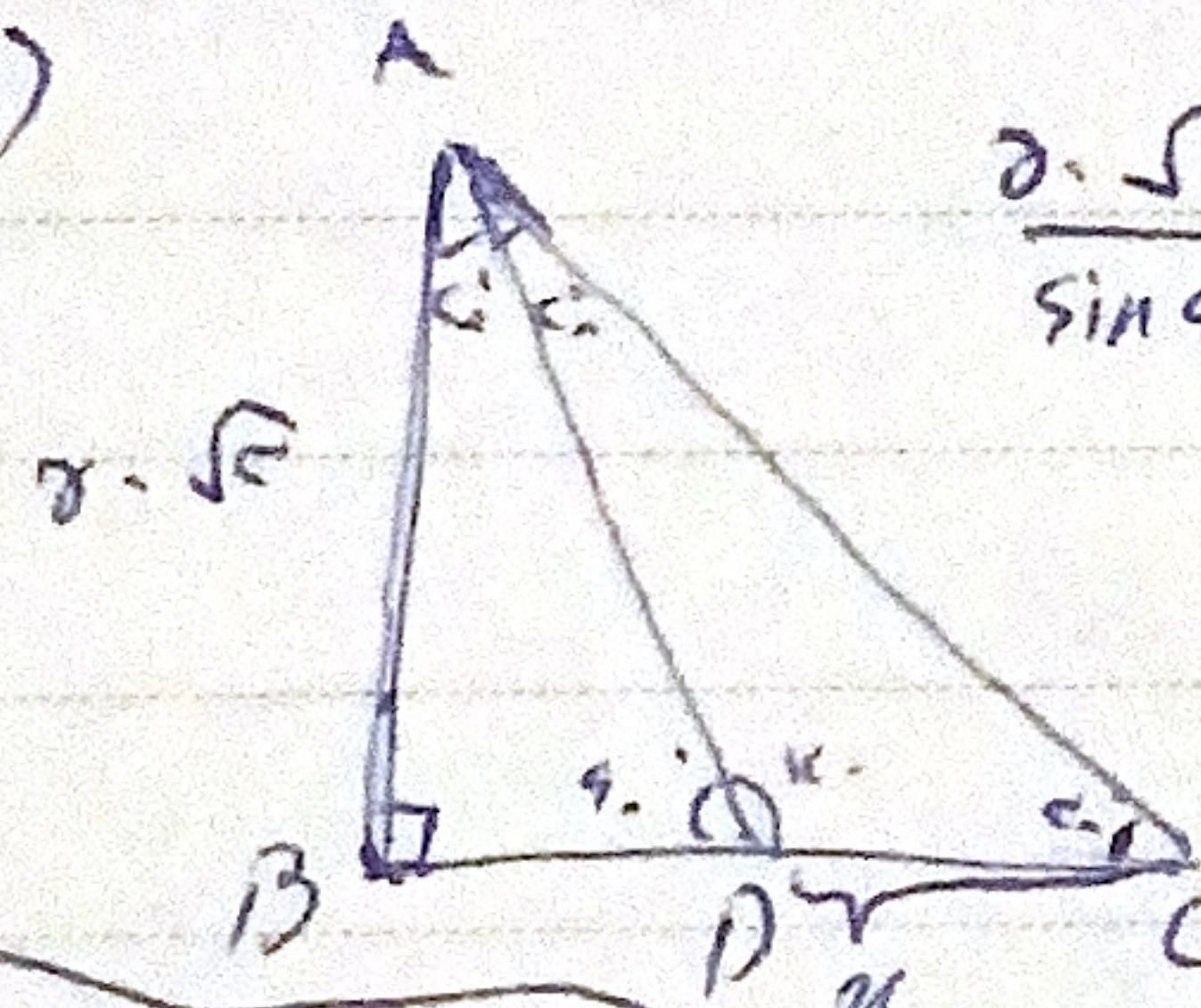
$= \frac{\sqrt{2} - \sqrt{2}}{2} \cdot \frac{\sqrt{2} + \sqrt{2}}{2} = \frac{2 - 2}{4} = -\frac{1}{2}$  صاف و صاف

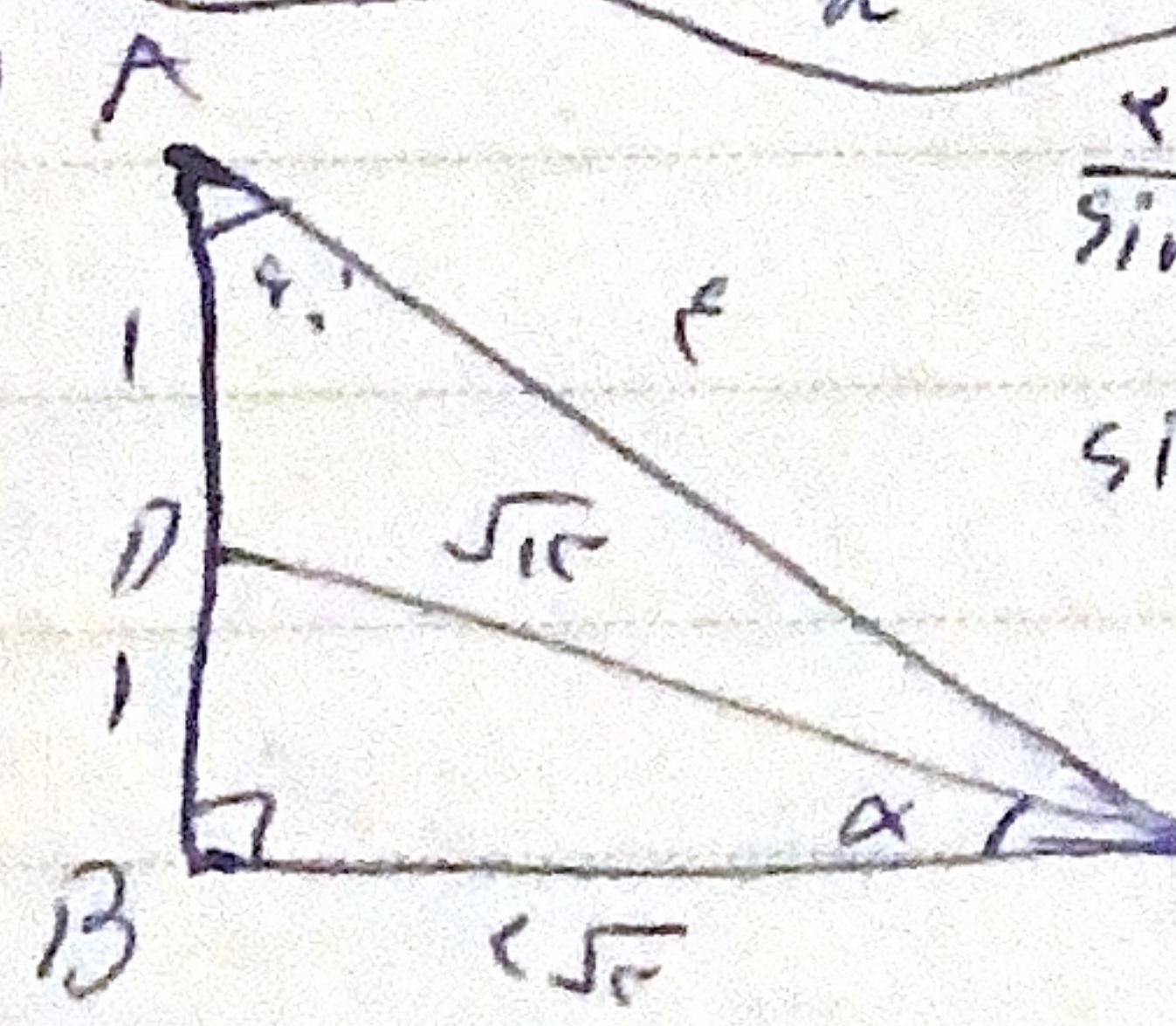
ب)  $\frac{1 + 5 \left( \frac{\sqrt{2}}{2} \right)^2}{4 \left( \frac{\sqrt{2}}{2} \right)^2 + 2 \left( -\frac{\sqrt{2}}{2} \right)^2} = \frac{1 + 5 \cdot \frac{1}{2}}{2 \cdot \frac{2}{2} + 2 \cdot \frac{1}{2}} = \frac{1}{2}$

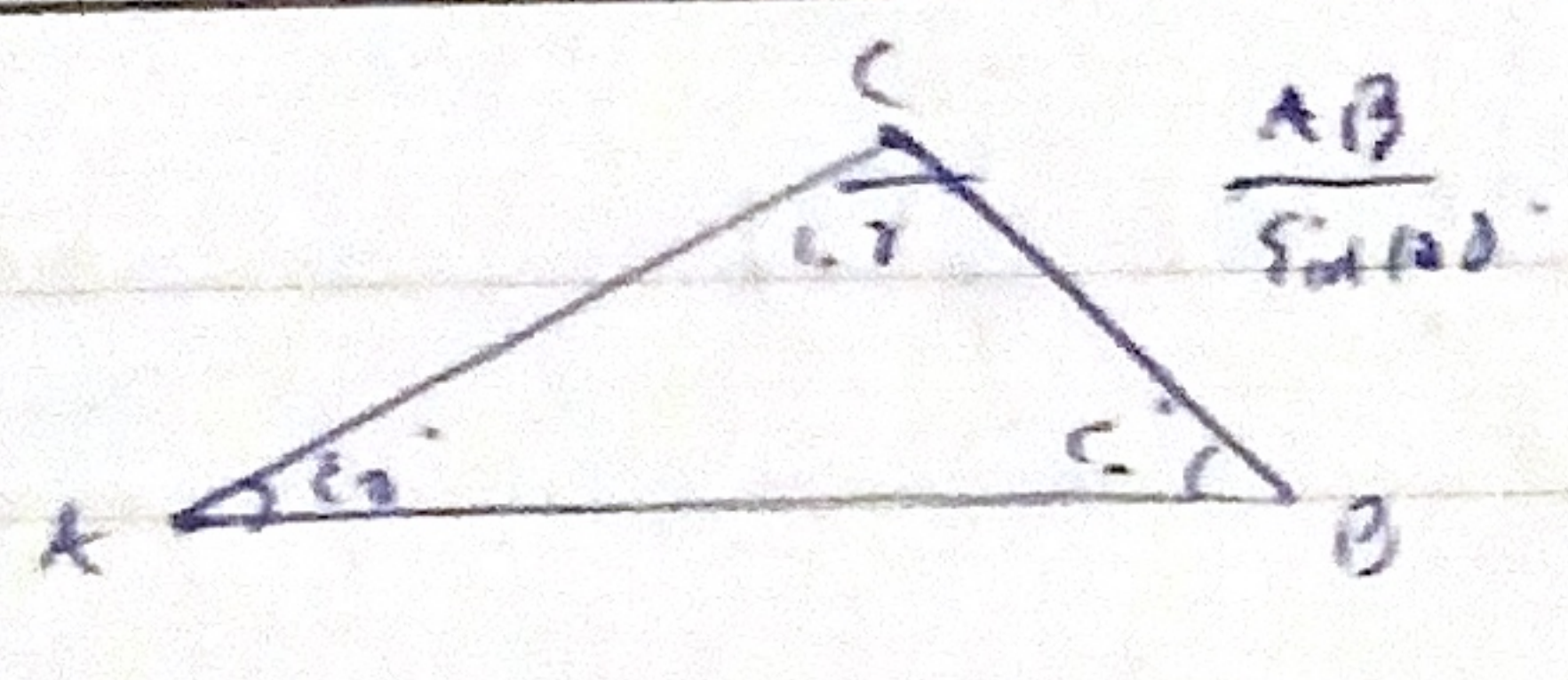
الف)   $\frac{\sqrt{4}}{\sin 45^\circ} = \frac{AH}{\sin 20^\circ} = \frac{BH}{\sin 45^\circ} \Rightarrow \frac{\sqrt{4}}{1} = \frac{AH}{\frac{\sqrt{2}}{2}} \Rightarrow AH = BH = \sqrt{2}$   
 $\frac{\sqrt{5}}{\sin 90^\circ} = \frac{HC}{\sin 90^\circ} \Rightarrow \frac{\sqrt{5}}{1} = \frac{HC}{1} \Rightarrow HC = \sqrt{5}$

$\frac{HC}{\sin 90^\circ} = \frac{\sqrt{5}}{1} \Rightarrow \frac{HC}{\frac{\sqrt{5}}{2}} = \frac{\sqrt{5}}{1} \Rightarrow HC = 2$

ب)   $\frac{4}{\sin 90^\circ} = \frac{AC}{\sin 90^\circ} \Rightarrow \frac{4}{1} = \frac{AC}{1} \Rightarrow AC = \frac{4}{\sqrt{5}}$   
 $\frac{\sqrt{4}}{\sin 90^\circ} = \frac{1/\sqrt{5}}{\sin B} \Rightarrow \frac{\sqrt{4}}{1} = \frac{1/\sqrt{5}}{\sin B} \Rightarrow \sin B = \frac{1}{\sqrt{5}} \Rightarrow B = \arcsin \frac{1}{\sqrt{5}}$

الف)   $\frac{8\sqrt{2}}{\sin 45^\circ} = \frac{AD}{\sin 45^\circ} \Rightarrow \frac{8\sqrt{2}}{\frac{\sqrt{2}}{2}} = \frac{AD}{1} \Rightarrow AD = 16$   
 $\triangle ADC$  قائم الزاویه  $\rightarrow AD = DC \Rightarrow \angle(AC) = 100^\circ$

ب)   $\frac{1}{\sin 90^\circ} = \frac{BC}{\sin 90^\circ} \Rightarrow \frac{1}{1} = \frac{BC}{\frac{\sqrt{2}}{2}} \Rightarrow BC = \sqrt{2}$   
 $\sin 90^\circ = \frac{BC}{AC} = \frac{\sqrt{2}}{2} \Rightarrow \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} \Rightarrow AC = 2$   
 $\frac{1}{\sin 90^\circ} = \frac{AD}{\sin 90^\circ} \Rightarrow \frac{1}{1} = \frac{AD}{1} \Rightarrow AD = 1$   
 $\frac{\sqrt{2}}{\sin 45^\circ} = \frac{1}{\sin \alpha} \Rightarrow \frac{\sqrt{2}}{1} = \frac{1}{\sin \alpha} \Rightarrow \sin \alpha = \frac{1}{\sqrt{2}} \Rightarrow \alpha = 45^\circ$



$$\frac{AB}{\sin 105^\circ} = \frac{AC}{\sin 30^\circ} \Rightarrow \sin(45^\circ + 30^\circ) = \sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ$$

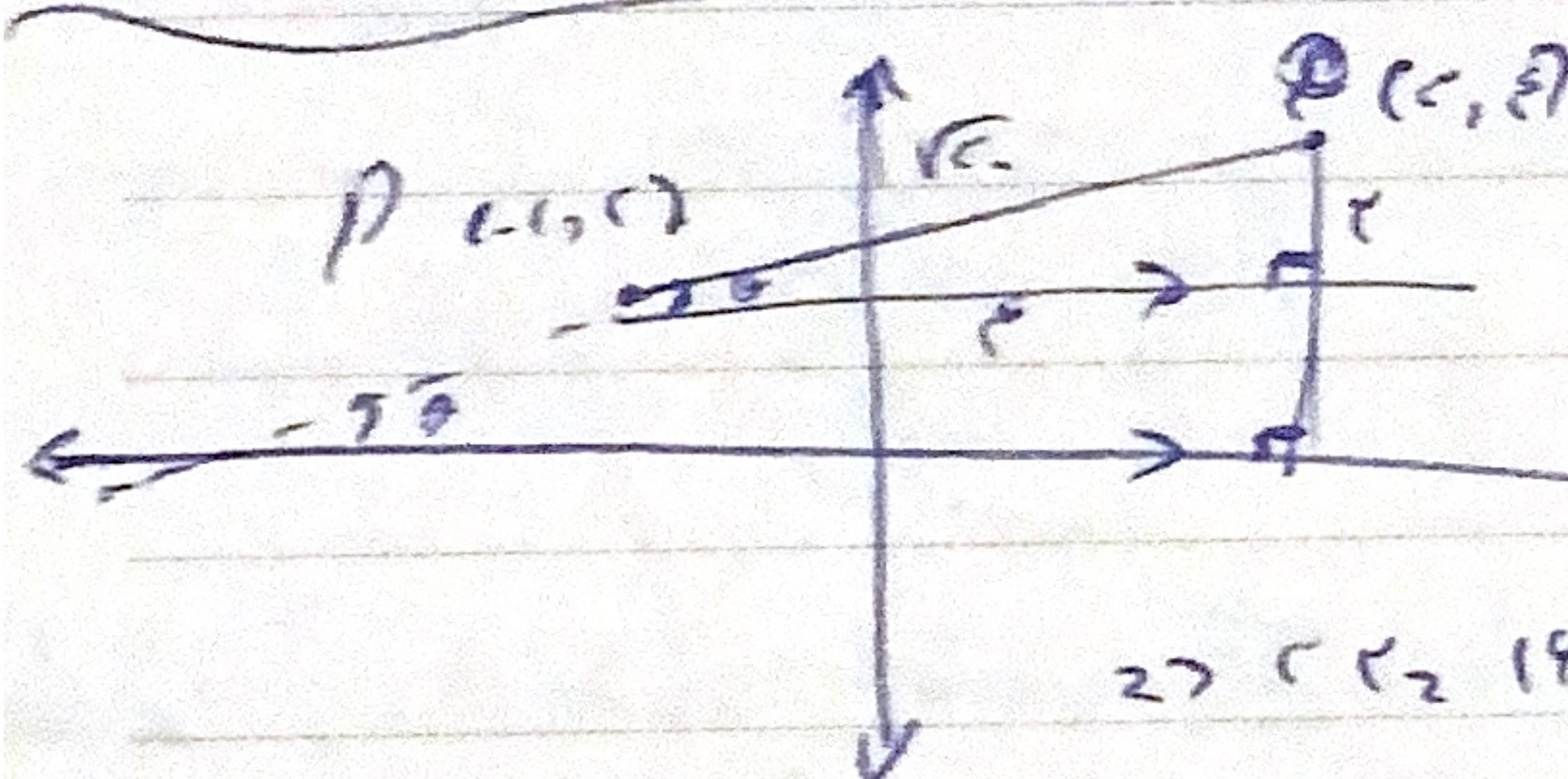
$$= \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}$$

$$\frac{AB}{\frac{\sqrt{2} + \sqrt{2}}{2}} = \frac{AC}{\frac{1}{2}} \Rightarrow AB = \frac{\sqrt{2} + \sqrt{2}}{2} \times AC \Rightarrow \frac{AB}{AC} = \frac{\sqrt{2} + \sqrt{2}}{1}$$

$$\frac{\sin \angle ABE}{\sin \angle BAE} = \frac{r \times r \times \sin 135^\circ}{x} = \frac{1}{1} = \frac{r}{x}$$

$$(i) r \times r \times \sin 135^\circ = x \times r \times \frac{\sqrt{2}}{2} \Rightarrow \underline{r\sqrt{2}}$$

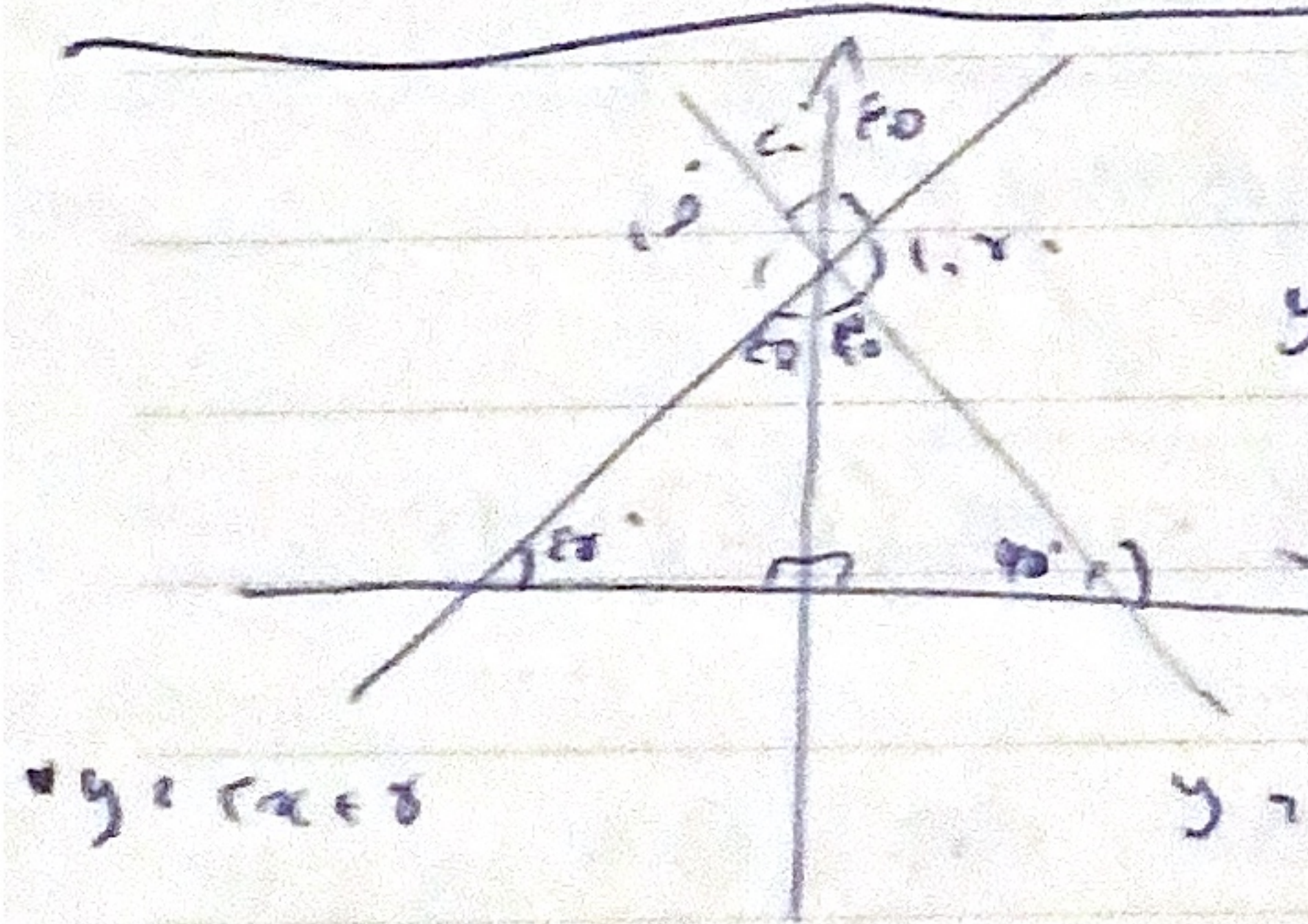
$$(ii) \frac{1}{r} \times r \times r \times \sin 135^\circ = x \times r \times \frac{1}{r} \times \frac{\sqrt{2}}{2} \Rightarrow \underline{r\sqrt{2}}$$



$$r^2 + \left(\frac{r}{\sqrt{2}}\right)^2 = r^2$$

$$r^2 + \frac{r^2}{2} = r^2 \Rightarrow r^2 = 19r^2 - r^2 \times \frac{\sqrt{2}}{2} \times \cos \theta$$

$$\Rightarrow -r^2 = -19\sqrt{2} \times \cos \theta \Rightarrow \cos \theta = \frac{r}{19\sqrt{2}} \Rightarrow \cos \theta = \frac{1}{19\sqrt{2}}$$



$$y = r \cos \theta \Rightarrow y = x + 0$$

$$y = mx + b, b = r, \theta$$

$$m = \tan 135^\circ = \frac{\sqrt{2}}{2} = -\sqrt{2}$$

$$y = mx + b, mb = r, \theta(-\sqrt{2}) = \frac{-8\sqrt{2}}{1}$$

$$f\left(\frac{8\pi}{9}\right) = \cos\left(\pi + \frac{8\pi}{9}\right) + \sin\left(\frac{\pi}{9} - \frac{8\pi}{9}\right) - \tan\left(\frac{\pi}{9} + \frac{8\pi}{9}\right)$$

$$\Rightarrow \cos \frac{11\pi}{9} + \sin\left(-\frac{\pi}{9}\right) - \tan \frac{9\pi}{9} = \frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{2}}{2}\right) - \sqrt{2} = -\sqrt{2}$$

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