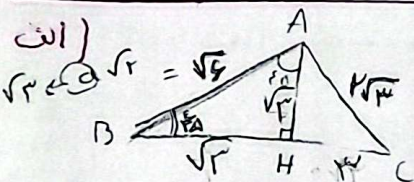




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$$\begin{aligned} & (\sin 135^\circ + \sin 225^\circ) (\cos 315^\circ - \cos 15^\circ) \\ &= \left(\frac{\sqrt{2}}{2} + (-\frac{\sqrt{2}}{2}) \right) \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \right) \\ &= \frac{\sqrt{2} - \sqrt{2}}{2} \times \frac{\sqrt{2} + \sqrt{2}}{2} = \frac{-1}{4} \end{aligned}$$

$$\text{ب) } \frac{1 + 3 \tan^2 21^\circ}{4 \cos^2 21^\circ + 3 \cos^2 69^\circ} = \frac{1 + 3 \times \frac{1}{4}}{4 \times \frac{4}{5} + 3 \times \frac{1}{5}} = \frac{1.75}{4.6} = \frac{1}{3}$$



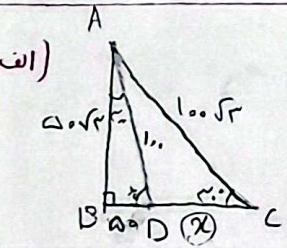
$$CH = \sqrt{12 - 3} = 3$$

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ب)

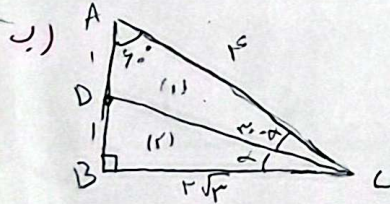
$$\begin{aligned} 9 &= \frac{\sqrt{2}}{2} AC \\ 9 \times \frac{2}{\sqrt{2}} &= AC \\ 9 \times \frac{2\sqrt{2}}{2} &= AC \rightarrow AC = 9\sqrt{2} \\ \sin B &= \frac{3\sqrt{2}}{9\sqrt{2}} = \frac{1}{3} = \frac{\sqrt{2}}{2} \end{aligned}$$

$B = 45^\circ$

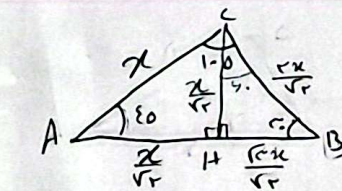


$$\begin{aligned} BC &= \frac{\sqrt{2}}{2} \times 10 \times \sqrt{2} = 10 \\ DC &= 10 - 0 = 10 \\ 0 \cdot \sqrt{2} &= \frac{\sqrt{2}}{2} AD \\ 0 \cdot \sqrt{2} \times \frac{2}{\sqrt{2}} &= AD \\ 10 &= AD \end{aligned}$$

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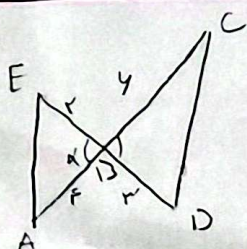


$$\begin{aligned} BC &= \frac{\sqrt{2}}{2} \times 2 = \sqrt{2} \\ DC &= \sqrt{12 + 1} = \sqrt{13} \\ \sin \alpha &= \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13} \end{aligned}$$



$$\begin{aligned} \frac{AB}{AC} &= ? \\ \frac{x(\sqrt{2} + 1)}{\frac{x(\sqrt{2} + 1)}{\sqrt{2}}} &= \frac{\sqrt{2} + 1}{\sqrt{2}} \end{aligned}$$

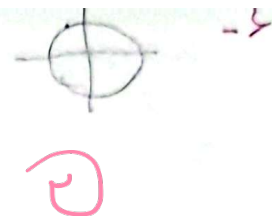
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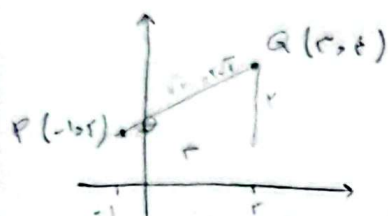
$$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \sin \alpha \times x \times y}{\frac{1}{2} \times \sin \alpha \times x \times y} = \frac{x}{y}$$

-۵

ا) 
$$S = r \left(\frac{1}{r} \sin 120^\circ \times r \times r \times 2 \right)$$
$$S = \frac{\sqrt{3}}{r} \times r \times r = 4\sqrt{3}$$

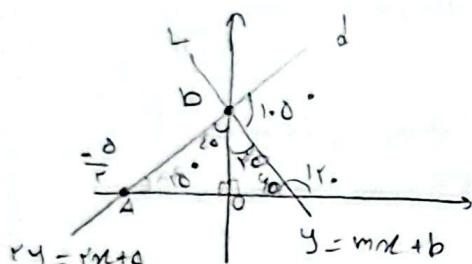
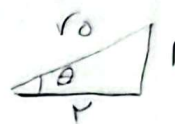


ب) 
$$S = r \left(\frac{1}{r} \times \sin 120^\circ \times r \times r \times 2 \right) = \frac{\sqrt{3}}{r} \times r \times r = 4\sqrt{3}$$



$$\cos \theta = ? \quad \frac{r}{r_0} = \frac{\sqrt{3}}{2}$$

$$m = \frac{\Delta y}{\Delta x} = \frac{r - r}{r + 1} = \frac{r}{r} = 1 = \tan \theta$$



$$mb = ? \rightarrow -\sqrt{r} \times \frac{1}{r} = -\frac{\sqrt{r}}{r}$$

$$m = \tan 120^\circ$$

$$y = -\sqrt{r}x + b$$

$$m = -\sqrt{r}$$

$$|b_0| = |A_0| = \frac{1}{r} \rightarrow b = \frac{1}{r}$$

$$y = x + \frac{1}{r}$$

$$m = 1 \rightarrow \tan \alpha = 1 \rightarrow \alpha = 45^\circ$$

1, 1, 1

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

$$f\left(\frac{\pi}{r}\right) = ?$$

$$f(x) = -\cos(x) + \cos(x) + \cot(x) = \cot(x)$$

$$f\left(\frac{\pi}{r}\right) = \cot \frac{\pi}{r} = \frac{-\sqrt{r}}{r}$$

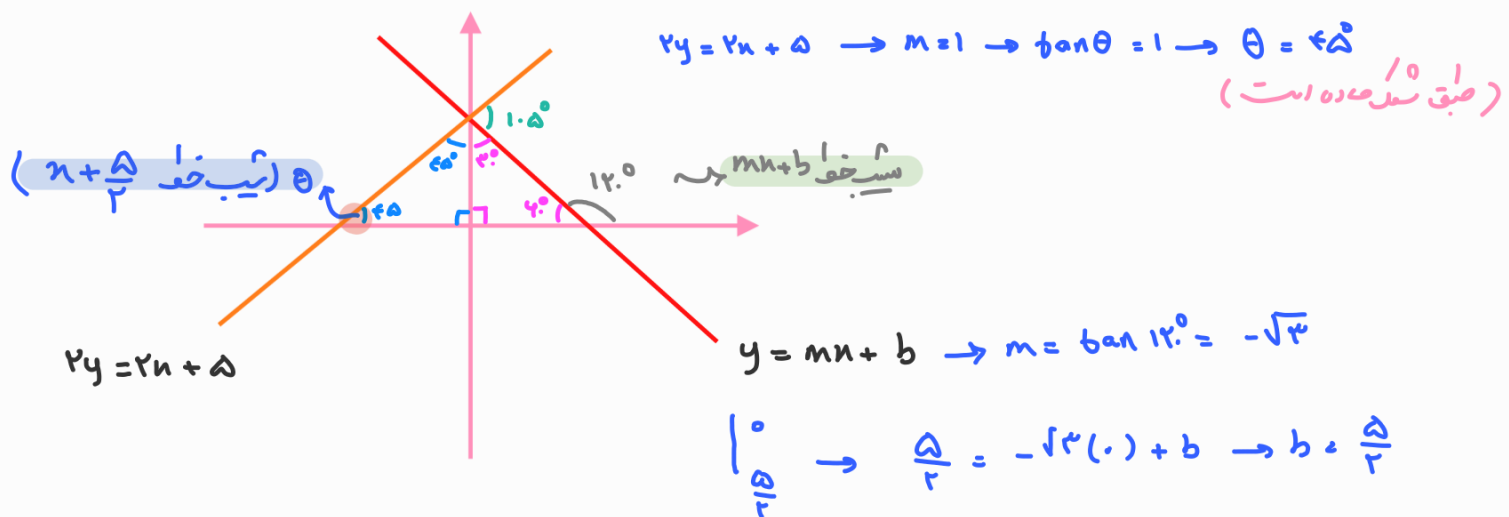
$$\frac{\cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} = \frac{-\sqrt{r}}{\frac{1}{r}} = -\sqrt{r}$$

$$\frac{\sin\left(\frac{14\pi}{r} + x\right) + \cos\left(\frac{10\pi}{r} - x\right)}{\cos(r\pi + x) - \sin(4\pi - x)} = \frac{\sin\left(\frac{\pi}{r} + x\right) + \cos\left(\frac{\pi}{r} - x\right)}{\cos(r\pi + x) - \sin(4\pi - x)}$$

$$\frac{14\pi}{r} = \frac{14\pi + \pi}{r} = 15\pi + \frac{\pi}{r}$$

$$\frac{18\pi}{r} = \frac{18\pi + \pi}{r} = 19\pi + \frac{\pi}{r}$$

$$= \frac{\cos x - \sin x}{-\cos x + \sin x} = -1$$



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$$\underbrace{(\pi + \pi)}_{-C \cdot \sin} + \underbrace{\sin\left(\frac{\pi}{r} - \pi\right)}_{C \sin} - \tan\left(\frac{\pi}{r} + \pi\right)_{\cot \pi}$$

$$\phi(\pi) = \cot \pi \rightarrow \phi\left(\frac{\omega \pi}{4}\right) = \cot\left(\frac{\omega \pi}{4}\right) = -\sqrt{3}$$