

سؤال ١

$$\text{a)} (\sin 120^\circ + \sin 30^\circ) (\cos 30^\circ - \cos 120^\circ)$$

$$+ \frac{r_1}{r} + - \frac{r_2}{r} = \frac{r_1 - r_2}{r} + \frac{r_1}{r} \Rightarrow \frac{r_1}{r} = \frac{r_1 + r_2}{r}$$

$$\frac{(r_1 - r_2)(r_1 + r_2)}{r} = \frac{r_1 - r_2}{r} \Rightarrow \frac{r_1 - r_2}{r} = \frac{-1}{r}$$

$$\text{b)} \frac{1 + \cos 120^\circ}{r} = \frac{1 + \cos 30^\circ}{r} \Rightarrow 1 + \frac{1}{r} = \frac{r}{r}$$

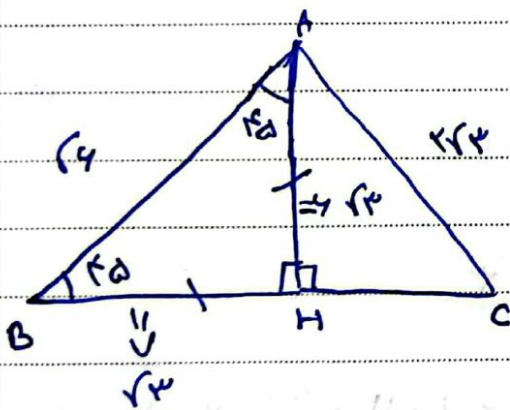
$$r \cos 120^\circ + r \cos 30^\circ$$

$$r + 1 = r$$

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

$$\left(\frac{r}{r}\right)^2 = \frac{r}{r} \Rightarrow \frac{r}{r} = \frac{r}{r} \Rightarrow \left(\frac{r}{r}\right)^2 = \frac{r}{r} \Rightarrow \frac{r}{r} = 1$$

سؤال ٢



$$r^2 + r^2 = 4$$

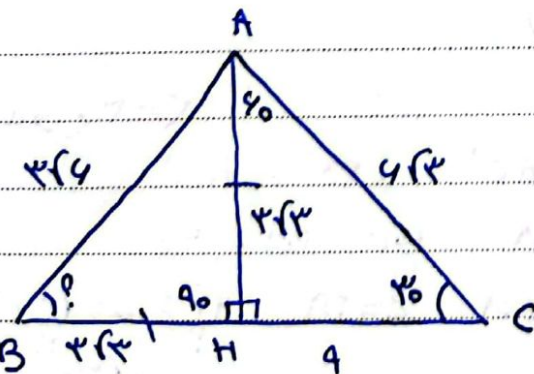
$$2r^2 = 4 \Rightarrow r^2 = 2 \Rightarrow r = \sqrt{2}$$

$$(AH)^2 + (HC)^2 = (AC)^2$$

$$(AC)^2 - (AH)^2 = (HC)^2$$

$$(2\sqrt{2})^2 - r^2 = 4 \Rightarrow 8 - r^2 = 4 \Rightarrow r^2 = 4$$

$$(HC)^2 = 4 \Rightarrow HC = 2$$



$$\frac{r}{r} \cdot r = 4 \Rightarrow r = 4 \cdot \frac{r}{r}$$

$$r = 1 \cdot \frac{r}{r} = \frac{r}{r} = \frac{r}{r} = \frac{r}{r}$$

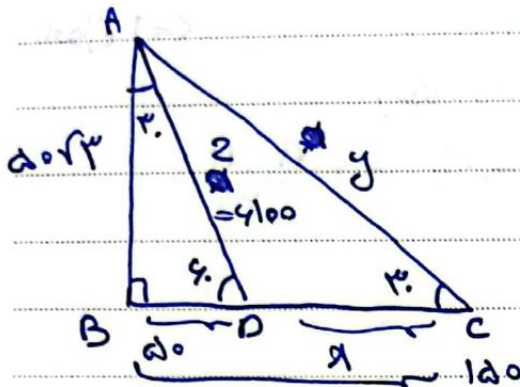
$$4r \cdot \frac{1}{r} = 4r$$

$$(4r)^2 - (2r)^2 = 4 \Rightarrow 16r^2 - 4r^2 = 4 \Rightarrow 12r^2 = 4 \Rightarrow r^2 = \frac{1}{3} \Rightarrow r = \frac{1}{\sqrt{3}}$$

$$\Rightarrow \hat{B} = 30^\circ$$

Arman

سؤال ٣



$$\frac{\sqrt{x}}{y} = \frac{40}{100} \quad \frac{2}{1} = \frac{40}{100} \times \frac{y}{\sqrt{x}} = 400$$

$$(100)^2 - (40)^2 = 10000 - 1600 = 8400$$

$$\sqrt{8400} = \sqrt{42 \times 10^2} = 42 \times 10 = 420$$

$$\frac{1}{y} = \frac{40}{100} \quad y = 100 \sqrt{x}$$

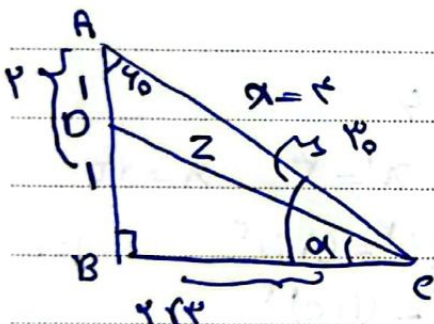
$$(100\sqrt{x})^2 - (40)^2 = 4 \quad (100\sqrt{x})^2 - 1600 = 4$$

$$10000 - 1600 = 4$$

$$\sqrt{8400} = 4 \sqrt{42 \times 10^2} = 4 \times 10 \times \sqrt{42} = 420$$

$$100 - 20 = 80$$

$$x = 100$$

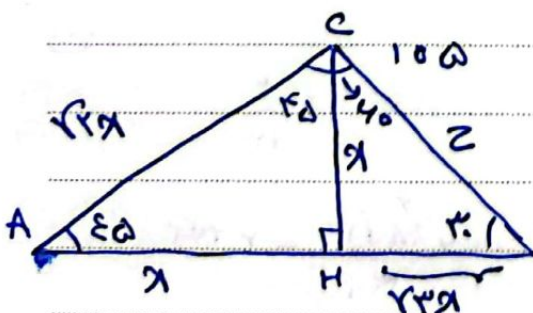


$$\frac{1}{x} = \frac{2}{2} \quad x = 2$$

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

$$1 + (2)^2 = 2^2 = 4 \quad 1 + 4 = 2^2 = 4 \quad \boxed{2 = \sqrt{4}}$$

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



$$x^2 + x^2 = AC^2 \quad 2x^2 = AC^2$$

$$AC = \sqrt{2}x \quad 100 - 40 = 60$$

$$\frac{1}{y} = \frac{2}{2} \quad 2 = 2x \quad \frac{\sqrt{x}}{y} = \frac{2}{2} \times \frac{y}{x} = 4 \sqrt{x}$$

$$AC = \sqrt{2}x$$

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

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

$$f(x) = \cos(\pi + x) + \sin(\frac{\pi}{4} - x) - \tan(\frac{3\pi}{4} + x)$$

$$-\cancel{\cos x} + \cancel{\cos x} - \cot x$$

$$+ \cot x$$

$$f(\frac{5\pi}{4}) = \cot \frac{5\pi}{4} = -\frac{1}{1} = -1$$

$$\sin(\frac{11\pi}{4} + x) + \cos(\frac{13\pi}{4} - x)$$

$$\cos(3\pi + x) - \sin(4\pi - x)$$

$$\frac{11\pi}{4} = 4\pi - \frac{\pi}{4} + \frac{\pi}{4}$$

$$+ \cos x + - \sin$$

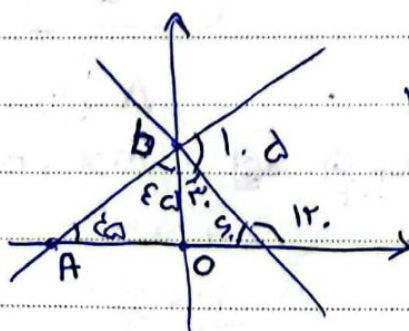
$$= -1$$

$$- \cos + \sin$$

$$\frac{13\pi}{4} = 4\pi - \frac{\pi}{4} + \frac{\pi}{4}$$

$$3\pi = 4\pi - \pi$$

$$4\pi = 0 + 4\pi$$



$$mb = ? \quad -r_x x - \frac{a}{r} = a r_x$$

$$m = \tan \alpha \quad y = -r_x x + b$$

$$m = r_x$$

$$b = AO = -\frac{a}{r} \rightarrow b = -\frac{a}{r}$$

$$r y = r x + a$$

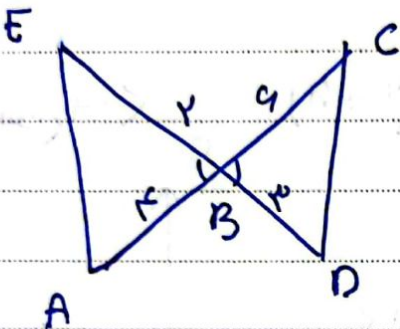
$$y = x + \frac{a}{r} \quad m = 1 \quad \tan \alpha = 1 \quad \alpha = 45^\circ$$

Arman

Subject:

Year: Month: Day:

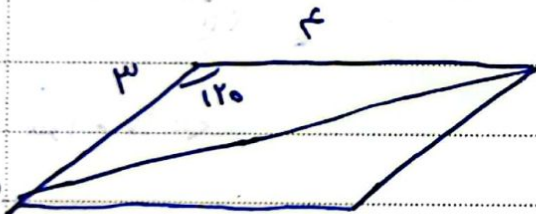
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سؤال 4 <=

$$\frac{ABE}{BCD} = \frac{r \times f \times \frac{1}{p} \times \sin 120}{r \times 4 \times \frac{1}{p} \times \sin 120} = 4 \frac{1}{18}$$

$$\frac{r}{9 \times 18} = 4 \left[\frac{r}{9} \right]$$

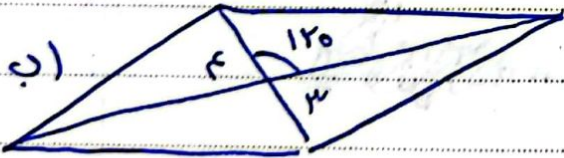


سؤال 4 <=

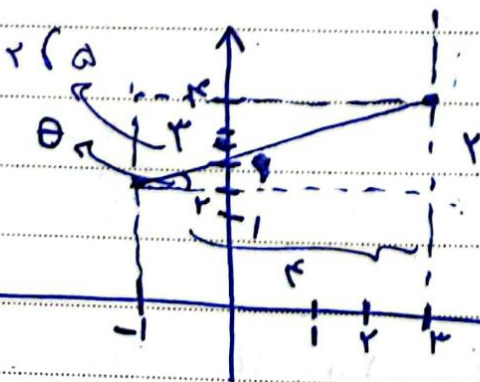
$$r \times \frac{1}{p} \times \sin 120 \times \frac{1}{p} = 4 \times r \times \frac{1}{p}$$

$$r \times \frac{1}{p} \times 12 = 4 \left[\frac{r}{p} \right]$$

الف



$$r \times \left(\frac{1}{p} \times \sin 120 \times \frac{1}{p} \times \frac{1}{p} \right) = \frac{r}{p} \times 12 = 4 \times \frac{r}{p}$$



سؤال 4 <=

$$P = (-16, 4)$$

$$Q = (4, 6)$$

$$\cos \theta = \frac{\theta}{12.6} = \frac{r}{12.6 \times 12.6}$$

$$r^2 + r^2 = 12 + 12 = 24$$

$$r \sqrt{2} = 4 \times 12.6$$

$$\left[\frac{r \sqrt{2}}{12.6} \right]$$

سؤال 4 <=