

Subject:

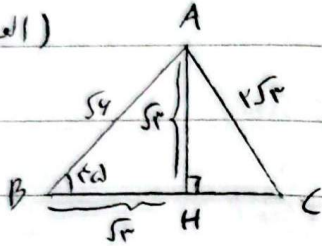
Year : Month : Day : ()

سوال (۱) الف)
$$\left(\frac{\sqrt{2} - \sqrt{3}}{2} \right) \left(\frac{\sqrt{2} + \sqrt{3}}{2} \right) = \frac{\sqrt{2}^2 - \sqrt{3}^2}{4} = \frac{2-3}{4} = -\frac{1}{4}$$

ب)
$$\frac{1 + 3\left(\frac{1}{\sqrt{3}}\right)^2}{4\left(\frac{\sqrt{3}}{2}\right)^2 + 2\left(\frac{\sqrt{2}}{2}\right)^2} = \frac{1+1}{3+1} = \frac{2}{4} = \frac{1}{2}$$

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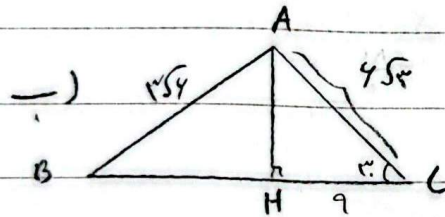
الف)



سوال (۲)
$$\cos 45^\circ = \frac{BH}{AB} \Rightarrow BH = 5 \cdot \frac{\sqrt{2}}{2} = \frac{5\sqrt{2}}{2}$$

مساوات
$$(5\sqrt{2})^2 = (3)^2 + (CH)^2 \Rightarrow CH = 7$$

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$$\cos 30^\circ = \frac{CH}{AC} = \frac{3}{4} \Rightarrow CH = 3 \cdot \frac{4}{2} = 6$$

$$\frac{AB}{\sin 30^\circ} = \frac{AC}{\sin B} \Rightarrow \sin B = \frac{4 \cdot \frac{1}{2}}{5} = \frac{2}{5} \Rightarrow B = \arcsin\left(\frac{2}{5}\right)$$

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سوال (۳)

الف)
$$\tan 45^\circ = \frac{BD}{BC} \Rightarrow BD = BC$$

20

$$\tan 30^\circ = \frac{1}{\sqrt{3}} \Rightarrow \frac{BD}{BC} = \frac{1}{\sqrt{3}} \Rightarrow BC = \sqrt{3} \cdot BD$$

ب)
$$\cot 45^\circ = \frac{1}{\sqrt{3}} \Rightarrow \frac{BD}{BC} = \frac{1}{\sqrt{3}} \Rightarrow BC = \sqrt{3} \cdot BD$$

$$(5\sqrt{3})^2 + 1^2 = DC^2 \Rightarrow DC = \sqrt{76}$$

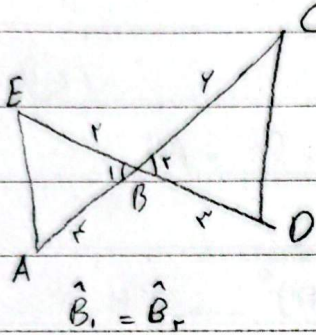
$$\sin \alpha = \frac{1}{\sqrt{76}} = \frac{\sqrt{76}}{76}$$

$$\hat{B} = 110 - (100 + 40) = 30^\circ$$

(سوال ٤)

$$\frac{AB}{\sin C} = \frac{AC}{\sin B} \rightarrow \frac{AB}{AC} = \frac{\sin C}{\sin B} = \frac{\sin(40+40)}{\sin 30} = \frac{\sin 40 \cos 40 + \sin 40 \cos 40}{\sin 30}$$

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



$$S_{AEB} = \frac{1}{2} \times r \times r \times \sin B = r^2 \sin B$$

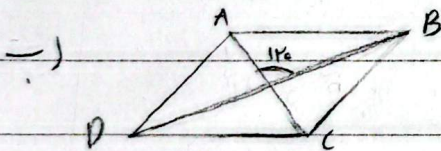
$$S_{BCD} = \frac{1}{2} \times r \times r \times \sin B = r^2 \sin B$$

$$\hat{B}_1 = \hat{B}_2$$

$$\text{نسبت } r \rightarrow \frac{r^2 \sin B}{r^2 \sin B} = \frac{r}{r}$$

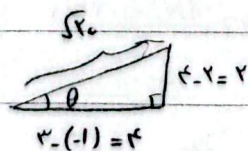
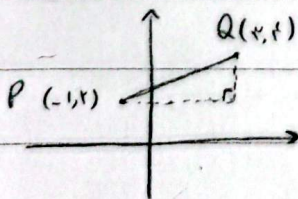
$$\text{الف) } S_{\text{مجموع المثلثات}} = 2 \times S_{\text{مثلث}} = 2 \times r^2 \times \sin 110^\circ = 4 \sqrt{2}$$

(سوال ٦)



$$S_{ABCD} = \frac{1}{2} AC \times BD \times \sin 110^\circ =$$

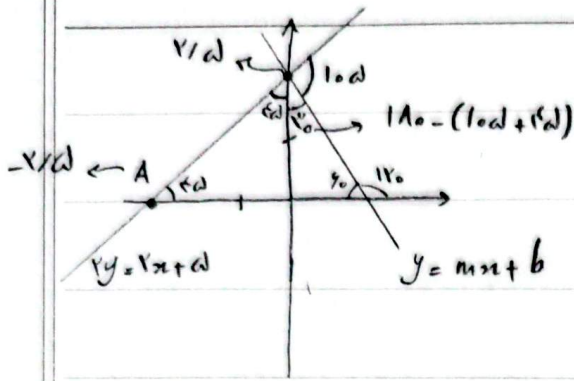
$$\frac{1}{2} \times 3 \times 4 \times \frac{\sqrt{2}}{2} = 3\sqrt{2}$$



$$x^2 + y^2 = 2 \rightarrow x = \sqrt{2}$$

$$\cos \theta = \frac{x}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

(سوال ٧)



$$2y = 2x + a \rightarrow y = x + \frac{a}{2}$$

(سوال 1)

$$A: y = 0 \rightarrow 0 = x + \frac{a}{2} \rightarrow x = -\frac{a}{2}$$

$$m = \tan 120^\circ = -\sqrt{3}, \quad b = \frac{a}{2} \quad (\text{برخ از مبدأ})$$

(در خط یکسان است)

$$mb = -\sqrt{3} \times \frac{a}{2} = \frac{-a\sqrt{3}}{2}$$

$$f(x) = -\log x + \log x - (-\log x) = \log x$$

(سوال 9)

$$f\left(\frac{a\pi}{6}\right) \xrightarrow{120^\circ} = \log\left(\frac{a\pi}{6}\right) = -\sqrt{3}$$

(سوال 10)

$$\frac{\sin\left(\frac{13\pi}{4} + x\right) + \cos\left(\frac{13\pi}{4} - x\right)}{\cos(3\pi + x) - \sin(4\pi - x)} = \frac{\cos x - \sin x}{-\cos x - (-\sin x)} = \frac{\cos x - \sin x}{-(\cos x - \sin x)} = -1$$

$$\frac{13+3}{4}\pi$$