نام و نام خانوادگی ....مبینا دیناروندی عطی.... پاسخنامه تشریحی تکلیف شماره ۲۷ کلاس ....یازدهم ریاضی....

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$S_{A\hat{B}C} = \frac{1}{2} \times AB \times AC \times \sin\alpha \Rightarrow 4/5 = \sqrt{3} \times \frac{3}{2} \times \frac{1}{2} \times \sin\alpha \Rightarrow \sin\alpha = \frac{3}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{2}$

$\Rightarrow \sin\alpha = \frac{\sqrt{3}}{2}$ ↦ $\alpha = 60^\circ$ ، $\alpha = 120^\circ$ $\Rightarrow \frac{120}{60} = ②$ ⇐ جواب

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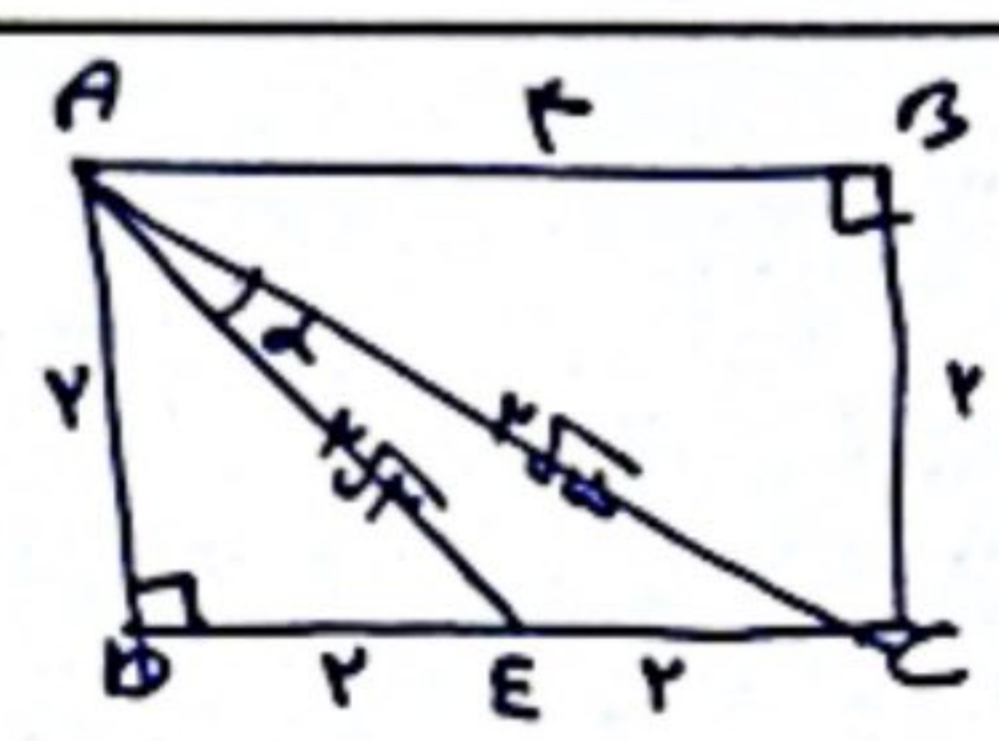

• فیثاغورس در $A\hat{D}E$ $\Rightarrow AE = \sqrt{AD^2 + ED^2} \Rightarrow AE = \sqrt{2 \times 2^2} = 2\sqrt{2}$

• فیثاغورس در $A\hat{B}C$ $\Rightarrow AC = \sqrt{AB^2 + AC^2} \Rightarrow AC = \sqrt{4^2 + 2^2} = 2\sqrt{5}$

$S_{A\hat{E}C} = \frac{\text{ارتفاع} \times \text{قاعده}}{2} = \frac{EC \times AD}{2} = \frac{2 \times 2}{2} = 2$ (*)

$S_{A\hat{E}C} = \frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{5} \times \sin\alpha \overset{(*)}{\Rightarrow} 2 = \frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{5} \times \sin\alpha \Rightarrow \sin\alpha = \frac{\sqrt{10}}{10}$

$\sin^2\alpha + \cos^2\alpha = 1$

$\Rightarrow \left(\frac{\sqrt{10}}{10}\right)^2 + \cos^2\alpha = 1$

$\Rightarrow \cos\alpha = \pm \frac{3}{\sqrt{10}}$

± حذف چون اضلاع یک مثلث نمی‌تواند منفی باشد

$\cot\alpha = \frac{\cos\alpha}{\sin\alpha} \Rightarrow \cot\alpha = \frac{\frac{3}{\sqrt{10}}}{\frac{\sqrt{10}}{10}} = \frac{30}{10} = ③$ → جواب

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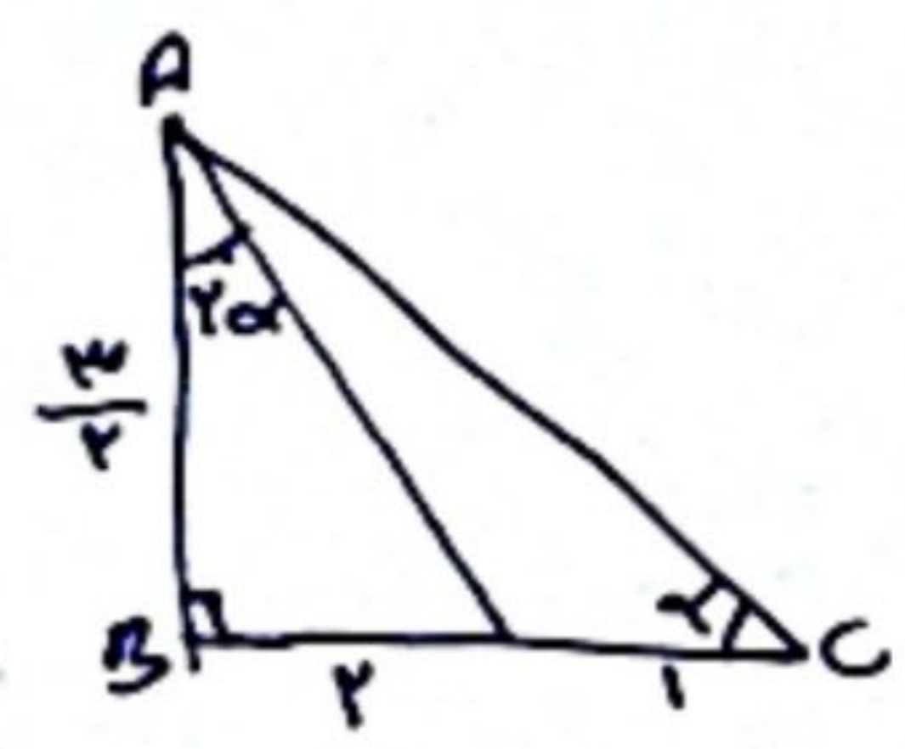

• $\tan\alpha = \frac{AB}{BC} = \frac{AB}{3}$ (*)

• $\tan 2\alpha = \frac{2}{AB}$

$\tan(2\alpha) = \frac{2\tan\alpha}{1 - \tan^2\alpha} \overset{(*)}{\Rightarrow} \frac{2}{AB} = \frac{\frac{2AB}{3}}{1 - \frac{AB^2}{9}} = \frac{\frac{2AB}{3}}{\frac{9 - AB^2}{9}} = \frac{6AB}{9 - AB^2} \Rightarrow \frac{2}{AB} = \frac{6AB}{9 - AB^2}$

$\Rightarrow 3AB^2 = 9 - AB^2 \Rightarrow 4AB^2 = 9 \Rightarrow AB^2 = \frac{9}{4} \Rightarrow AB = \pm \frac{3}{2} \Rightarrow \cot\alpha = \frac{BC}{AB}$

* ضلع مثلث نمی‌تواند منفی باشد

$\Rightarrow \cot\alpha = \frac{3}{\frac{3}{2}} = ②$ → جواب

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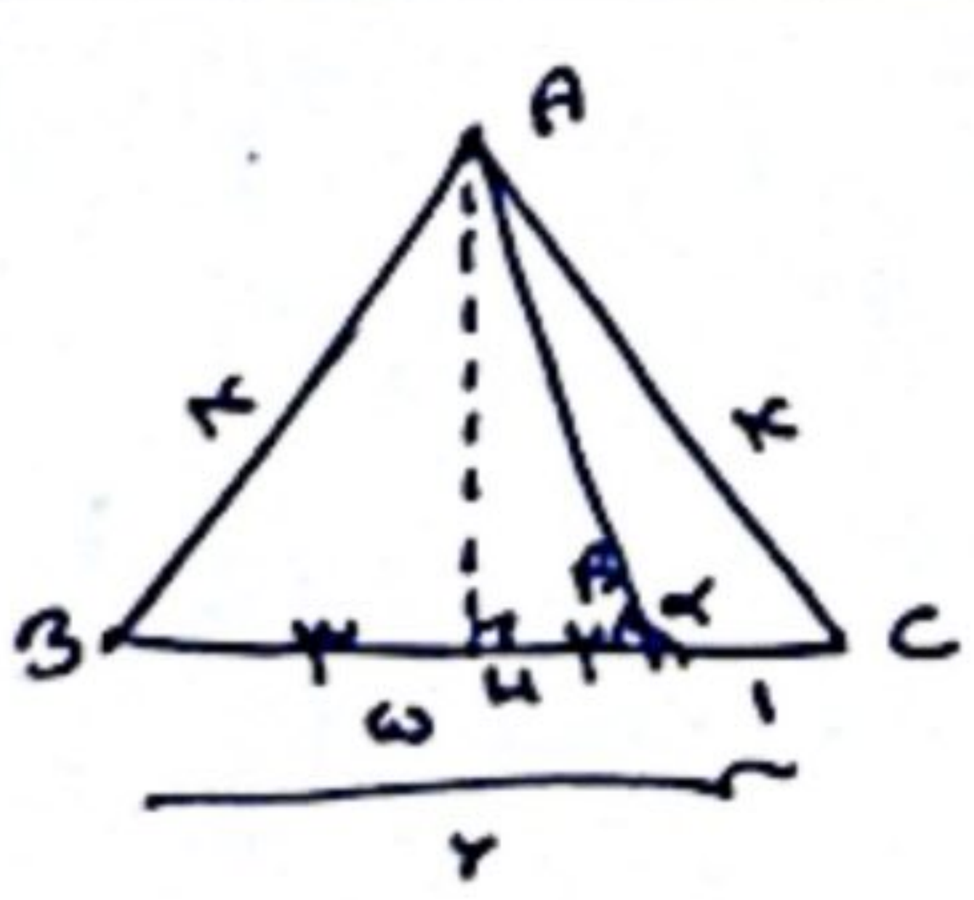

* در مثلث متساوی‌الساقین ارتفاع و میانه یکی است پس $BH = HC$

• فیثاغورس در $A\hat{H}C$: $AC = \sqrt{AH^2 + HC^2} \Rightarrow 4 = \sqrt{AH^2 + 9} \Rightarrow AH^2 = 7 \Rightarrow AH = \sqrt{7}$

$\alpha + \beta = 180^\circ$

⇐ پس tan آن‌ها قرینه است (*)

(*) $\Rightarrow \tan\alpha = -\tan\beta = -\tan(180 - \alpha) = \frac{-\sqrt{7}}{2}$ → جواب

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$2\sin^2 u + \cos^2 u = \frac{4}{3} \Rightarrow 2\sin^2 u + 1 - \sin^2 u = \frac{4}{3} \Rightarrow \sin^2 u = \frac{1}{3}$ (*)

($\cos^2 u$ ↦ $1 - \sin^2 u$)

(*) $\Rightarrow \sin^2 u + \cos^2 u = 1 \Rightarrow \frac{1}{3} + \cos^2 u = 1 \Rightarrow \cos^2 u = \frac{2}{3}$ ★

(*) , ★ $\Rightarrow \tan^2 u = \frac{\sin^2 u}{\cos^2 u} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ → جواب

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$$\frac{\sin^4\alpha + 4\cos^2\alpha}{1+\cos^2\alpha} - \frac{\cos^4\alpha + 4\sin^2\alpha}{1+\sin^2\alpha} = 2-\sin^2\alpha - 2 + \cos^2\alpha = \cos^2\alpha - \sin^2\alpha = \cos 2\alpha$$

جواب

$$\frac{\sin^4\alpha + 4\cos^2\alpha}{1+\cos^2\alpha} \quad (1-\sin^2\alpha) \quad 1-\sin^2\alpha = \frac{\sin^4\alpha + 4 - 4\sin^2\alpha}{2-\sin^2\alpha} = \frac{(2-\sin^2\alpha)^2}{2-\sin^2\alpha} = 2-\sin^2\alpha \quad (3)$$

$$\frac{\cos^4\alpha + 4\sin^2\alpha}{2+\sin^2\alpha} \quad (1-\cos^2\alpha) \quad 1+\cos^2\alpha = \frac{\cos^4\alpha + 4 - 4\cos^2\alpha}{2-\cos^2\alpha} = \frac{(2-\cos^2\alpha)^2}{2-\cos^2\alpha} = 2-\cos^2\alpha$$

۷

$$\sin\left(\frac{3\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right) - \tan\left(\alpha - \frac{5\pi}{2}\right) \Rightarrow \cos\alpha \times -\sin\alpha - (-\cot\alpha) = -\cos\alpha\sin\alpha + \cot\alpha$$

$$\Rightarrow -\frac{3}{5}\times\frac{4}{5} + \frac{3}{4} = 0/24$$

جواب

$$\cot\alpha = \frac{1}{\tan\alpha} = \frac{3}{4} \quad (2)$$

$$1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \Rightarrow 1+\frac{16}{9} = \frac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = \frac{3}{5}$$

$$\cos^2\alpha + \sin^2\alpha = 1 \Rightarrow \frac{9}{25} + \sin^2\alpha = 1 \Rightarrow \sin\alpha = \frac{4}{5}$$

۸

$$\sqrt{2}(\sin u - \cos u) = \sqrt{2}\times\sqrt{2}\times\sin\left(\frac{\pi}{12} - \frac{\pi}{4}\right) = 2\sin\left(-\frac{\pi}{6}\right) = -1$$

$\sin - \cos u = \sqrt{2}\sin(u - \frac{\pi}{4})$ فرمول مثلثاتی

$$3\cos\left(\frac{4\pi}{12}\right) = 3\cos\left(\frac{\pi}{3}\right) = \frac{3}{2}$$

$$\frac{3}{2} - 1 = \frac{1}{2}$$

جواب

۹

$$\tan\frac{\alpha}{2} = \frac{1}{4} \Rightarrow \tan\alpha = \frac{2\tan\left(\frac{\alpha}{2}\right)}{1-\tan^2\frac{\alpha}{2}} \Rightarrow \tan\alpha = \frac{2\times\frac{1}{4}}{1-\frac{1}{16}} \Rightarrow \tan\alpha = \frac{\frac{1}{2}}{\frac{15}{16}} = \frac{8}{15}$$

$$1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \Rightarrow 1+\frac{64}{225} = \frac{1}{\cos^2\alpha} \Rightarrow \frac{289}{225} = \frac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = \frac{15}{17}$$

$$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} \Rightarrow \frac{8}{15} = \frac{\sin\alpha}{\frac{15}{17}} \Rightarrow \sin\alpha = \frac{8}{17}$$

$$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{-14}{1-5}$$

جواب

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$$\sin 2\alpha = 2\sin\alpha\cos\alpha \Rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha \xrightarrow{\sin\alpha > 0} \cos\alpha > 1$$ غ ق ق

① $\sin\alpha > 0$ ✓ $\cos\alpha < 1$ ق ق

$$\frac{\cot\alpha}{\sin\alpha} = \frac{\cos\alpha}{\sin^2\alpha} > 0 \Rightarrow \cos\alpha > 0 \quad (2)$$

① و ② ← درنامیه ← جواب

چارم