۲۰ آذرین

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ...۱۲... کلاس ...دهم...

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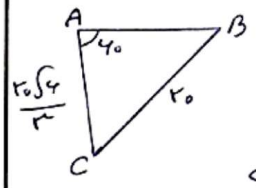


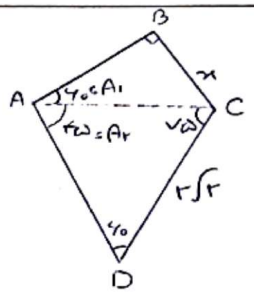

$\hat{B}+\hat{C}=۱۲۰ \rightarrow ۱۸۰-۱۲۰=۶۰=\hat{A}$

$\frac{a}{\sin A}=\frac{b}{\sin B} \rightarrow \frac{۳۰}{\sin ۶۰}=\frac{۲۰\sqrt{۶}}{۳}\sin B \rightarrow \sin B=\frac{\sqrt{۳}}{۲}\times\frac{۳}{۲\sqrt{۶}}=\frac{\sqrt{۱۸}}{۶}=\frac{۳\sqrt{۲}}{۶}=\frac{\sqrt{۲}}{۲}$

$\sin B=\frac{\sqrt{۲}}{۲} \rightarrow \hat{B}=۴۵$

$۱۲۰-۴۵=۷۵=\hat{C}$

۲




$۱۸۰-(۶۰+۷۵)=۴۵$

$\frac{a}{\sin A_۲}=\frac{d}{\sin D} \rightarrow \frac{۲\sqrt{۳}}{\frac{\sqrt{۲}}{۲}}=\frac{\overline{AC}}{\frac{\sqrt{۳}}{۲}} \rightarrow \overline{AC}=۳\times\frac{\sqrt{۲}}{۲}=۲\sqrt{۳}$

$\sin A_۲=\frac{x}{\overline{AC}} \rightarrow \frac{\sqrt{۲}}{۲}=\frac{x}{۲\sqrt{۳}} \rightarrow x=۲$

۳

$(b^۲-۲)\times\frac{\sin\hat{C}}{\sin\hat{B}}=c \rightarrow \frac{c}{\sin\hat{C}}=\frac{b}{\sin\hat{B}} \rightarrow \frac{\sin\hat{C}}{\sin\hat{B}}=\frac{c}{b}$

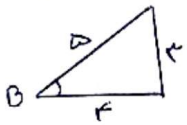
$\hookrightarrow (b^۲-۲)\times\frac{c}{b}=c \xrightarrow{c\neq ۰ \text{ است}} (b^۲-۲)\times\frac{۱}{b}=۱ \rightarrow b^۲-b-۲=۰ \rightarrow b=-۱$ غیرقابل قبول

$b=۲$ قابل قبول

۴

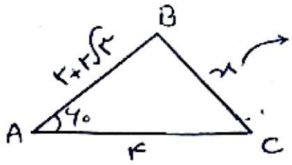
$b^۲=a^۲+c^۲-۲ac\times\cos\hat{B} \rightarrow (۱۳)^۲=(۲۱)^۲+(۲۰)^۲-۲\times۲۰\times۲۱\times\cos\hat{B}$

$\rightarrow ۱۶۹=۴۴۱+۴۰۰-۸۴۰\times\cos\hat{B} \rightarrow \cos\hat{B}=\frac{۴}{۵}$




$\rightarrow \sin\hat{B}=\frac{۳}{۵}$

۵




الف) $x^۲=b^۲+c^۲-۲bc\times\cos\hat{A} \rightarrow x^۲=۱۶+۱۶+۸\sqrt{۳}-۲\times۴\times(۴+۲\sqrt{۳})\times\frac{۱}{۲}$

$\rightarrow x^۲=۳۲+۸\sqrt{۳}-۸-۸\sqrt{۳}=۲۴ \rightarrow x=۲\sqrt{۶}$

ب) $\frac{b}{\sin\hat{B}}=\frac{a}{\sin\hat{A}} \rightarrow \frac{۴}{\sin\hat{B}}=\frac{۲\sqrt{۶}}{\frac{\sqrt{۳}}{۲}} \rightarrow \sin\hat{B}=\frac{\sqrt{۲}}{۲} \rightarrow \hat{B}=۴۵$

$۱۸۰-(۶۰+۴۵)=۷۵=\hat{C}$

۶

$a^2 = b^2 + c^2 - 2bc\cos\hat{A} \rightarrow 4 = 4 + 1 - 2\times 2\times 1\cos\hat{A} \rightarrow \cos\hat{A} = \frac{1}{4}$

$(\overline{DE})^2 = (\overline{AE})^2 + (\overline{AD})^2 - 2(\overline{AE})(\overline{AD})\cos\hat{A} \rightarrow (\overline{DE})^2 = 36 + 16 - 2\times 6\times 4\times \frac{1}{4}$

$(\overline{DE})^2 = 40 \rightarrow \overline{DE} = 2\sqrt{10}$ ✓

۷

الف) $a^2 = b^2 + c^2 - 2bc\cos\hat{A} \rightarrow a^2 = 25 + 64 - 2\times 5\times 8\times \frac{1}{2} = 49 \rightarrow a = 7$ ✓

ب) $S = \frac{1}{2}\times b\times c\times \sin\hat{A} \rightarrow = \frac{1}{2}\times 5\times 8\times \frac{\sqrt{3}}{2} = 10\sqrt{3}$ ✓

۸

$\frac{(b+c)^2 - a^2}{bc(\cos\hat{A}+1)} = \frac{a^2 = b^2 + c^2 - 2bc\cos\hat{A}}{\rightarrow} \frac{b^2 + c^2 + 2bc - b^2 - c^2 + 2bc\cos\hat{A}}{bc(\cos\hat{A}+1)}$

$\rightarrow \frac{2bc(\cos\hat{A}+1)}{bc(\cos\hat{A}+1)} = 2$ ✓

۹

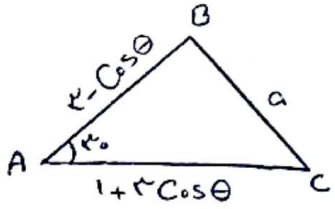
$\frac{a^2 + b^2 - c^2}{a+b-c} = a^2 \rightarrow a^2 + b^2 - c^2 = a^2 + a^2(b-c) \rightarrow (b-c)(b^2 + c^2 + bc) = a^2(b-c)$

طبق فرض سوال $b \neq c$ است پس $b - c \neq 0$ پس می‌توان آن را از دو طرف حذف کرد.

$\rightarrow b^2 + c^2 + bc = a^2 \rightarrow b^2 + c^2 + bc = b^2 + c^2 - 2bc\cos\hat{A}$

$\rightarrow \cos\hat{A} = \frac{bc}{-2bc} = \frac{-1}{2} \rightarrow \hat{A} = 120^\circ$ ✓

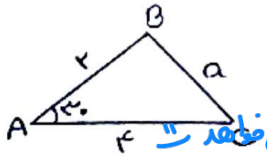
۱۰




$S_{\triangle} = 2 = \frac{1}{2}\times b\times c\times \sin\hat{A} \rightarrow \frac{1}{2}\times(3-\cos\theta)(1+2\cos\theta)\times\frac{1}{2} = 2$

$\rightarrow -2\cos^2\theta + 5\cos\theta + 3 = 8$

$\rightarrow -2\cos^2\theta + 5\cos\theta - 5 = 0 \rightarrow \cos\theta = 1$ قابل قبول، $\cos\theta = \frac{5}{2}$ غیرقابل قبول




$a^2 = b^2 + c^2 - 2bc\cos\hat{A} \rightarrow a^2 = 16 + 4 - 16\times\frac{\sqrt{3}}{2}$

$a^2 = 20 - 8\sqrt{3} \rightarrow a = \sqrt{20 - 8\sqrt{3}}$ ✓

سوال ۱۰ را می‌خواهد ۱۱

CamScanner