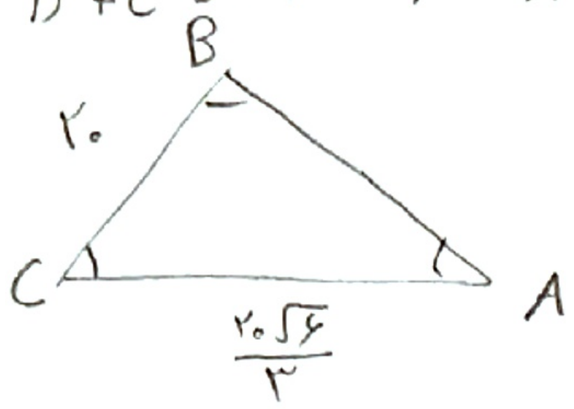
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$\hat{B}+\hat{C}=۱۲۰$ ، $\hat{A}=۶۰$

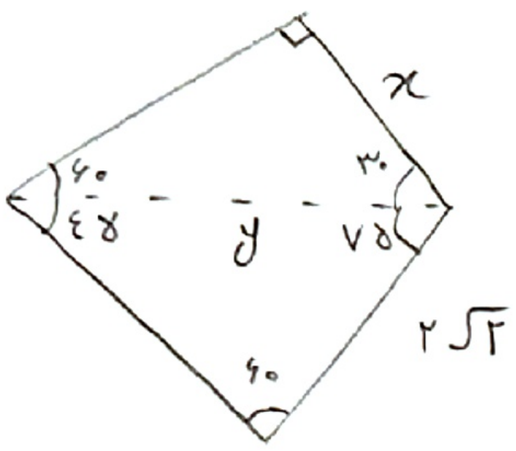


قضیه سینوس ها $\longrightarrow \frac{۲۰}{\sin\hat{A}} = \frac{\frac{۲۰\sqrt{۶}}{۳}}{\sin\hat{B}} \longrightarrow \frac{\sqrt{۶}}{۳}\times\frac{\sqrt{۳}}{۲} = \sin\hat{B}$

$\sin\hat{A} \downarrow \frac{\sqrt{۳}}{۲}$

$\sin\hat{B}=\frac{\sqrt{۲}}{۲} \longrightarrow \hat{B}=۴۵^\circ$ ✓ ، $\hat{C}=۷۵^\circ$ ✓

۲

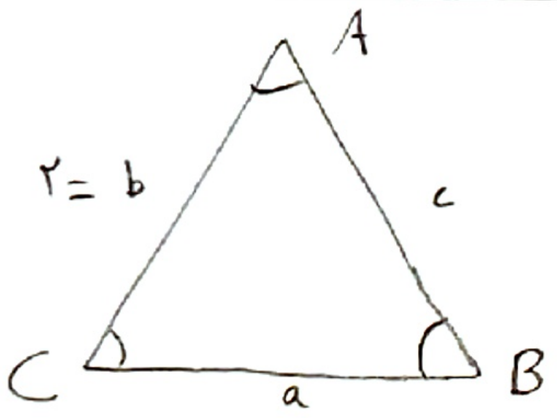


قضیه سینوس ها $\longrightarrow \frac{y}{\sin۶۰} = \frac{۲\sqrt{۲}}{\sin۴۵} \longrightarrow y=۲\sqrt{۳}$

$\sin۶۰ \downarrow \frac{\sqrt{۳}}{۲}$ ، $\sin۴۵ \downarrow \frac{\sqrt{۲}}{۲}$

$\frac{y=۲\sqrt{۳}}{\sin۹۰ \downarrow ۱} = \frac{x}{\sin۶۰ \downarrow \frac{\sqrt{۳}}{۲}} \longrightarrow x=۳$ ✓

۳

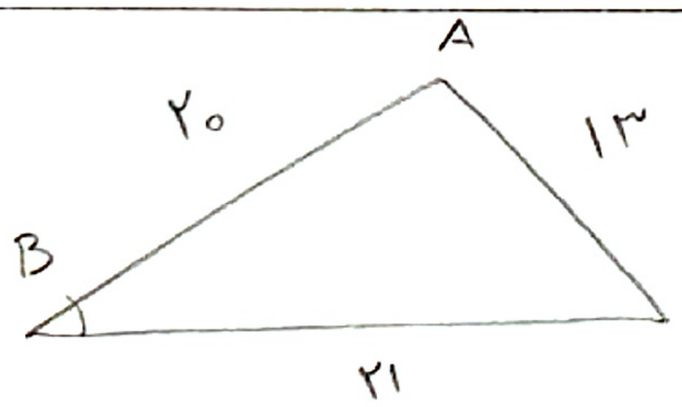


$(b^۲-۲)\frac{\sin\hat{C}}{\sin\hat{B}} = c \longrightarrow \frac{b^۲-۲}{\sin\hat{B}} = \frac{c}{\sin\hat{C}}$

$b^۲-۲=b \longrightarrow b^۲-b-۲=۰$

$b=۲$ ✓ ، $b=-۱$ ✗

۴

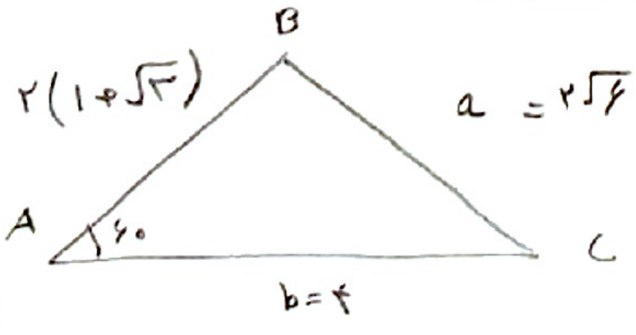


$۱۳^۲ = ۲۱^۲ + ۲۰^۲ - ۲\times۲۰\times۲۱\times\cos\hat{B}$

$۱۶۹ = ۴۴۱ + ۴۰۰ - ۸۴۰\cos\hat{B}$

$\cos\hat{B}=۰/۸$ ✓ $\longrightarrow \sin\hat{B}=۰/۶$ ✓

۵



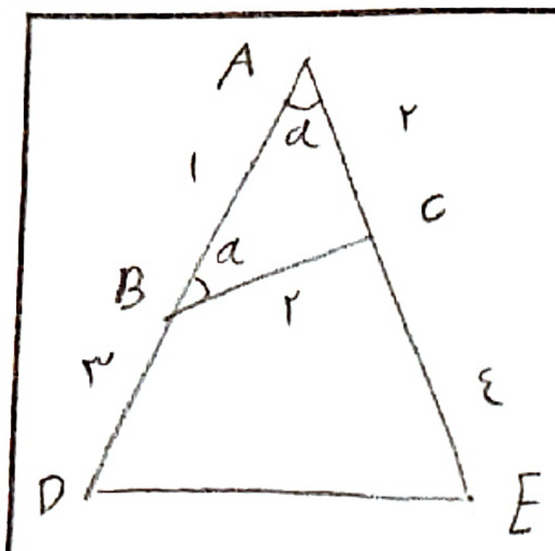
$a=۲\sqrt{۶}$

$a=\sqrt{۱۶+۴(۴+۲\sqrt{۳})-۸(۱+\sqrt{۳})} = \sqrt{۳۲-۸+۸\sqrt{۳}-۸\sqrt{۳}}$

$a=\sqrt{۲۴} = ۲\sqrt{۶}$ ✓ (الف)

قضیه سینوس ها $\longrightarrow \frac{۲\sqrt{۶}}{\sin۶۰ \downarrow \frac{\sqrt{۳}}{۲}} = \frac{۴}{\sin B} \longrightarrow \sin B=\frac{\sqrt{۲}}{۲}$ ، $\hat{B}=۴۵^\circ$ ✓

ب) $\hat{C}=۷۵^\circ$ ✓



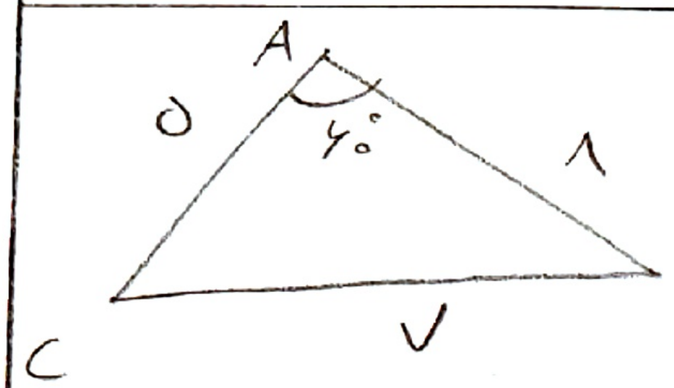
$AC = \sqrt{1+4-4\cos\alpha} = 2$

$4 = 8 - 4\cos\alpha \longrightarrow \cos\alpha = \frac{1}{2}$ ✓

$DE = \sqrt{36+16-48\left(\frac{1}{2}\right)} = \sqrt{40} = 2\sqrt{10}$ ✓

(۲)

۶



الف)

$CB = \sqrt{25+64-80\left(\frac{1}{2}\right)} = 7$ ✓

$BC = 7$

ب)

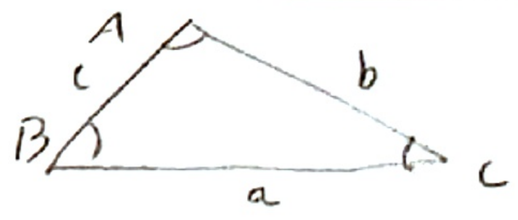
$S = \frac{1}{2} \times AC \times AB \times \sin\hat{A} = \frac{1}{2} \times 5 \times 8 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$ ✓

(۲)

۷

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

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



(۲)

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

۸

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

$a^3 + b^3 - c^3 = a^2(a+b-c)$

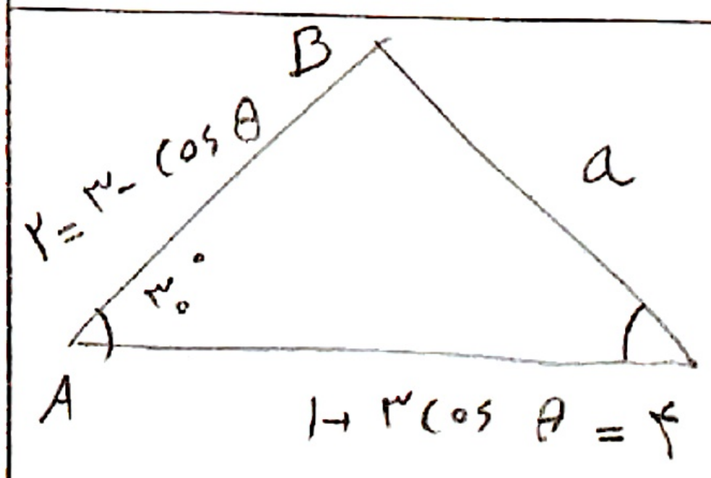
$a^3 + b^2 - c^3 = a^3 + a^2b - a^2c \longrightarrow b^2 - c^3 = a^2(b-c)$

(۲)

$(b-c)(b^2+c^2+bc) = a^2(b-c)$

$b^2 + c^2 + bc = a^2 \longrightarrow -2\cos\hat{A} = +1 \longrightarrow \cos\hat{A} = -\frac{1}{2} \rightarrow \hat{A} = 120$ ✓

۹



$S = \frac{1}{2}\sin 30\left(3-\cos\right)\left(1+3\cos\right) = 2$

$4-\cos)\ (1+3\cos) = 8 \longrightarrow \cos = 1$

$a^2 = 4+16-16\cos 30\ \frac{\sqrt{3}}{2}$

(۲)

$a^2 = 20 - 8\sqrt{3}$ ✓

۱۰