

$$\begin{cases} AB^2 = 8^2 + 3^2 - 2 \cdot 8 \cdot 3 \cos \alpha \\ AC^2 = 8^2 + 3^2 - 2 \cdot 8 \cdot 3 \cos \alpha \end{cases}$$

$\triangle ABD$

$\triangle ACD$

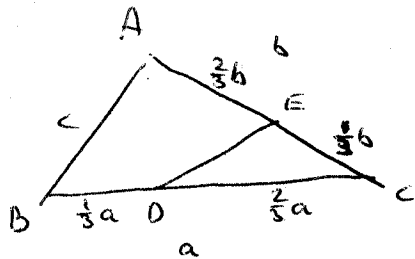
$AB = AC$
 אישווה את הצדדים

$$0 = 25 - 9 - 32 \cos \alpha$$

$$\frac{-16}{-32} = \cos \alpha \rightarrow \alpha = 60$$

$AB = AC = 7$ (אם הצדדים אישווה אז הזווית)

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$$c^2 = a^2 + b^2 - 2ab \cos \alpha$$

$\triangle ABC$

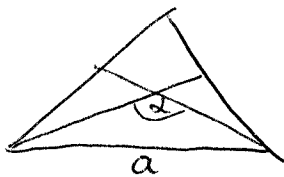
$$\cos \alpha = \frac{c^2 - a^2 - b^2}{-2ab}$$

$$DE^2 = \left(\frac{1}{3}b\right)^2 + \left(\frac{2}{3}a\right)^2 - 2 \cdot \frac{1}{3}b \cdot \frac{2}{3}a \cdot \cos \alpha$$

$\triangle DEC$

$$DE^2 = \frac{b^2}{9} + \frac{4a^2}{9} - \frac{4}{9}ab \cdot \frac{c^2 - a^2 - b^2}{-2ab} = \frac{b^2}{9} + \frac{4a^2}{9} + \frac{2c^2 - 2a^2 - 2b^2}{9} = \frac{2c^2 + 2a^2 - b^2}{9} \Rightarrow DE = \frac{1}{3} \sqrt{2c^2 + 2a^2 - b^2}$$

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היתכונים אחרים לא יתקבלו

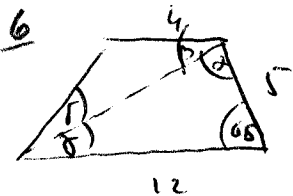


$$a^2 = \left(\frac{2}{3}n\right)^2 + \left(\frac{2}{3}m\right)^2 - 2 \cdot \frac{2}{3}n \cdot \frac{2}{3}m \cos \alpha$$

$$a^2 - \frac{4}{9}n^2 - \frac{4}{9}m^2 = -\frac{8nm}{9} \cos \alpha$$

$$\frac{9a^2 - 4n^2 - 4m^2}{9} = \frac{-8nm}{9} \cos \alpha \quad | \cdot 9$$

$$\cos \alpha = \frac{9a^2 - 4n^2 - 4m^2}{-8nm} = \frac{4n^2 + 4m^2 - 9a^2}{8nm}$$



$$10.88^2 = 5^2 + 12^2 - 2 \cdot 5 \cdot 12 \cos 65 = 118.28$$

הצד השני

$$10.88 = 10.8759$$

$$12^2 = 10.88^2 + 5^2 - 2 \cdot 5 \cdot 10.88 \cos \alpha$$

אז הצד השני

$$\cos \alpha = 0.00555$$

$$\alpha = 89.67$$

$$\beta = 180 - \alpha - 65 = 25.33$$

$$\begin{aligned} \text{הצד השני}^2 &= 4^2 + 10.88^2 - 2 \cdot 4 \cdot 10.88 \cdot \cos \beta = 55.17 \\ \text{הצד השני} &= 7.46 \end{aligned}$$

$$\gamma = 180 - 65 - \alpha = 25.33$$

$$\sqrt{\quad} \rightarrow 4^2 = 7.46^2 + 10.88^2 - 2 \cdot 7.46 \cdot 10.88 \cos \delta \Rightarrow \delta = 13.22 \rightarrow \delta + \beta = 38.55$$