

3. Stegreifaufgabe aus der Mathematik

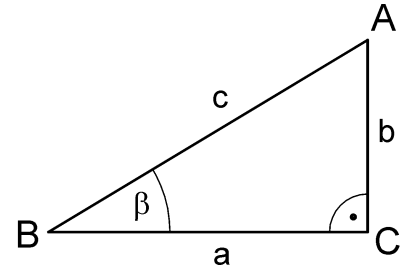
Klasse 10

- Lösungen -

1. Winkelfunktionen:

$$\tan\beta = \frac{b}{a} \quad \left| \quad \cos\beta = \frac{a}{c} \right.$$

$$\underline{b = a \cdot \tan\beta} \quad \left| \quad \underline{c = \frac{a}{\cos\beta}} \right.$$



Umfang des Dreiecks:

$$U = a + b + c$$

$$U = a + a \cdot \tan\beta + \frac{a}{\cos\beta}$$

$$\underline{\underline{U = a \left(1 + \tan\beta + \frac{1}{\cos\beta} \right)}}$$

$$U = 12,3 \text{ cm} \left(1 + \tan 34,5^\circ + \frac{1}{\cos 34,5^\circ} \right)$$

$$\underline{\underline{U \approx 35,68 \text{ cm}}}$$

2. Winkelfunktion im Dreieck BCD:

$$\cos\beta = \frac{\overline{DB}}{\overline{BC}}$$

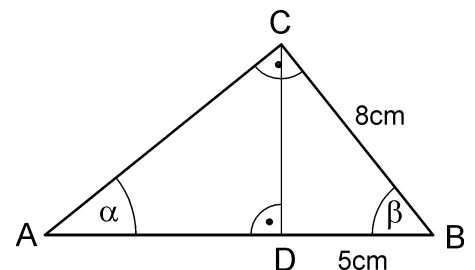
$$\cos\beta = \frac{5 \text{ cm}}{8 \text{ cm}}$$

$$\underline{\underline{\beta \approx 51,32^\circ}}$$

$$\alpha + \beta = 90^\circ$$

$$\alpha = 90^\circ - 51,32^\circ$$

$$\underline{\underline{\alpha = 38,68^\circ}}$$



Winkelfunktionen im Dreieck ABC:

$$\tan\alpha = \frac{\overline{BC}}{\overline{AC}}$$

$$\overline{AC} = \frac{\overline{BC}}{\tan\alpha}$$

$$\overline{AC} = \frac{8 \text{ cm}}{\tan 38,68^\circ}$$

$$\underline{\underline{\overline{AC} = 10,0 \text{ cm}}}$$

$$\sin\alpha = \frac{\overline{BC}}{\overline{AB}}$$

$$\overline{AB} = \frac{\overline{BC}}{\sin\alpha}$$

$$\overline{AB} = \frac{8 \text{ cm}}{\sin 38,68^\circ}$$

$$\underline{\underline{\overline{AB} = 12,8 \text{ cm}}}$$

- Lösungen -

3. Winkelfunktion im rechtwinkligen Dreieck:

$$\sin 34^\circ = \frac{x}{a}$$

$$x = a \cdot \sin 34^\circ$$

$$x = 3,4 \text{ cm} \cdot \sin 34^\circ$$

$$\underline{x = 1,90 \text{ cm}}$$

Diagonalenlänge d:

$$d = 2 \cdot x$$

$$\underline{\underline{d = 3,8 \text{ cm}}}$$

