

Pythagoras in ebenen Figuren – Lösungen

1) $s = \sqrt{t^2 - r^2} = \sqrt{18,4^2 - 12,3^2} = \sqrt{338,56 - 151,29} = \sqrt{187,27} = 13,7 \text{ cm}$

$$u = r + s + t = 12,3 + 13,7 + 18,4 = 44,4 \text{ cm}$$

$$A = \frac{r \cdot s}{2} = \frac{12,3 \cdot 13,7}{2} = \frac{168,51}{2} = 84,3 \text{ cm}^2$$

2) $A = \frac{x \cdot y}{2} \rightarrow 480 = \frac{20 \cdot y}{2} \quad / \cdot 2 \rightarrow 960 = 20 \cdot y \quad / : 20 \rightarrow y = 48 \text{ mm}$

$$z = \sqrt{x^2 + y^2} = \sqrt{20^2 + 48^2} = \sqrt{400 + 2304} = \sqrt{2704} = 52 \text{ mm}$$

$$u = x + y + z = 20 + 48 + 52 = 120 \text{ mm}$$

3) $x = 16,50 : 2 = 8,25 \text{ m}$

$$h = \sqrt{y^2 - x^2} = \sqrt{9,20^2 - 8,25^2} = \sqrt{84,64 - 68,0625} = \sqrt{16,5775} = 4,1 \text{ m}$$

$$A = \frac{c \cdot h_c}{2} = \frac{16,5 \cdot 4,1}{2} = \frac{67,65}{2} = 33,8 \text{ m}^2$$

4) $A = \frac{c \cdot h_c}{2} \rightarrow 26,1 = \frac{c \cdot 5,8}{2} \quad / \cdot 2 \rightarrow 52,2 = c \cdot 5,8 \quad / : 5,8 \rightarrow c = 9 \text{ cm} \rightarrow x = \frac{c}{2} = 4,5 \text{ cm}$

$$a = \sqrt{x^2 + h_c^2} = \sqrt{4,5^2 + 5,8^2} = \sqrt{20,25 + 33,64} = \sqrt{53,89} = 7,3 \text{ cm} \rightarrow a = b = 7,3 \text{ cm}$$

5) Gleichschenklig-rechtwinkeliges Dreieck und Rechteck

$$h_c = \frac{c}{2} = \frac{4,60}{2} = 2,30 \text{ m} \quad x = \frac{c}{2} = \frac{4,60}{2} = 2,30 \text{ m}$$

$$s = \sqrt{x^2 + h_c^2} = \sqrt{2,30^2 + 2,30^2} = \sqrt{5,29 + 5,29} = \sqrt{10,58} = 3,3 \text{ m}$$

$$A = A_D + A_R = \frac{c \cdot h_c}{2} + l \cdot b = \frac{4,6 \cdot 2,3}{2} + 4,6 \cdot 5,5 = 5,29 + 25,3 = 30,6 \text{ m}^2$$

$$u = l + b + b + s + s = 4,6 + 5,5 + 5,5 + 3,3 + 3,3 = 22,2 \text{ m}$$