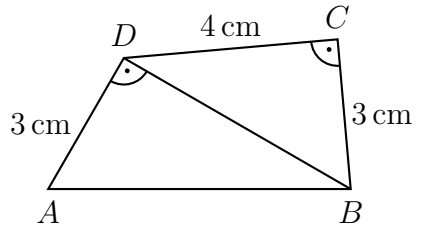
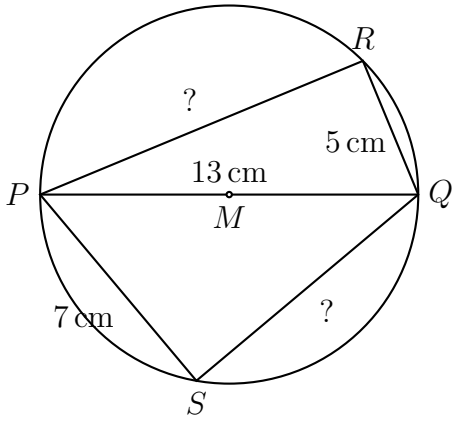
48. (a) Planfigur:



- $|BD| = \sqrt{3^2 + 4^2} = \mathbf{5\,cm}$
- $|AB| = \sqrt{3^2 + 5^2} = \sqrt{34} \approx \mathbf{5.83\,cm}$

(b) Planfigur:



Die Dreiecke PQR und PSQ sind rechtwinklig (Thaleskreis).

- $|PR| = \sqrt{13^2 - 5^2} = \mathbf{12\,cm}$
- $|SQ| = \sqrt{13^2 - 7^2} = \sqrt{120} \approx \mathbf{10.95\,cm}$

49. (a)
- $a = (u - 2b)/2 = (26 - 10)/2 = \mathbf{8\,dm}$
- $d = \sqrt{a^2 + b^2} = \sqrt{8^2 + 5^2} = \sqrt{89} \approx \mathbf{9.43\,dm}$
- $A = a \cdot b = 8 \cdot 5 = \mathbf{40\,dm^2}$

(b)
- $c = u - 2a = 64 - 50 = \mathbf{14\,cm}$
- $h = \sqrt{a^2 - (c/2)^2} = \sqrt{25^2 - 7^2} \approx \mathbf{24\,cm}$
- $A = c \cdot h/2 = 14 \cdot 24/2 = \mathbf{168\,cm^2}$

(c)
- $f/2 = \sqrt{s^2 - (e/2)^2} \quad \Rightarrow \quad f = 2\sqrt{15^2 - 12^2} = \mathbf{18\,cm}$
- $u = 4s = 4 \cdot 15 = \mathbf{60\,cm}$
- $A = e \cdot f/2 = 24\,\text{cm} \cdot 9/2 = \mathbf{108\,cm^2}$

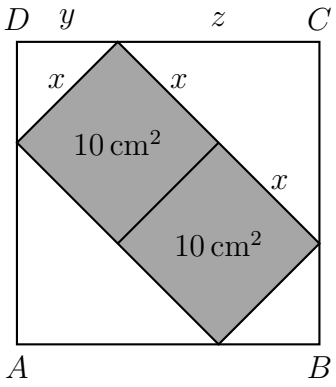
(d)
- $a = \sqrt{c^2 - a^2} = \sqrt{150^2 - 90^2} = \mathbf{120\,mm}$
- $b^2 = q \cdot c \quad \Rightarrow \quad q = b^2/c = 90^2/150 = \mathbf{54\,mm}$
- $p = c - q = 150 - 54 = \mathbf{96\,mm}$
- $h^2 = p \cdot q \quad \Rightarrow \quad h = \sqrt{p \cdot q} = \sqrt{96 \cdot 54} = \mathbf{72\,mm}$
- $A = a \cdot b/2 = 120 \cdot 90/2 = \mathbf{5400\,mm^2}$

50. Gegeben: $u = 42\,\text{cm}$

(a)
- $a = u/3 = 14\,\text{cm}$
- $h = \sqrt{3} \cdot \frac{a}{2} = \sqrt{3} \cdot \frac{14}{2} = \mathbf{12.12\,cm}$

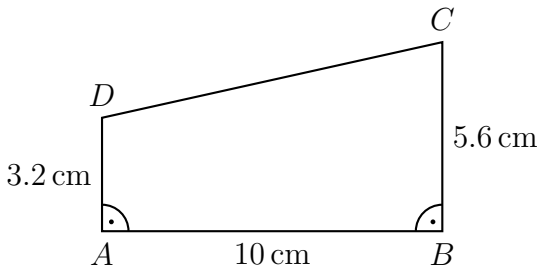
(b) $A = \sqrt{3} \cdot \frac{a^2}{4} = \sqrt{3} \cdot \frac{14^2}{4} = \mathbf{84.87\,cm^2}$

51. Planfigur:



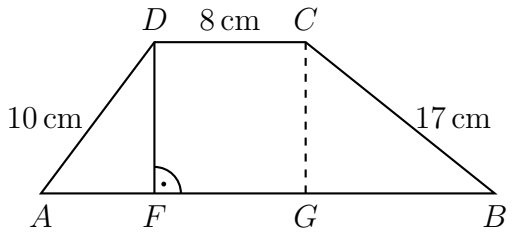
- $x = \sqrt{10}\,\text{cm}^2$
- $y = x : \sqrt{2} = \sqrt{10} : \sqrt{2} = \sqrt{5}\,\text{cm}$
- $z = 2x : \sqrt{2} = 2\sqrt{10} : \sqrt{2} = 2\sqrt{5}\,\text{cm}$
- $|DC| = \sqrt{5} + 2\sqrt{5} = 3\sqrt{5} = \mathbf{6.71\,cm}$

53. Planfigur:



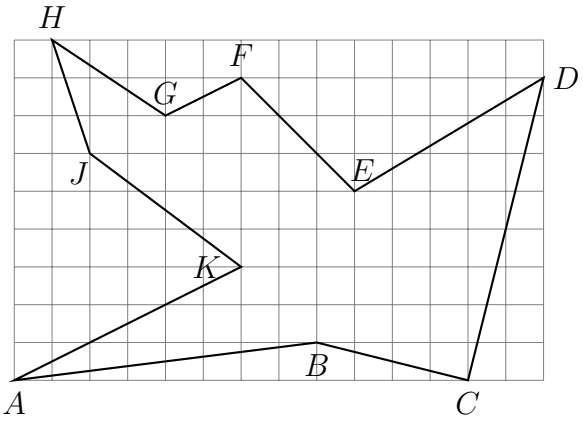
- $|DC| = \sqrt{10^2 + 2.4^2} = 10.28\,\text{cm}$
- $u = 10 + 5.6 + 10.28 + 3.2 = \mathbf{29.08\,cm}$
- $m = (3.2 + 5.6)/2 = 4.4\,\text{cm}$
- Flächeninhalt: $F = a \cdot m = 10 \cdot 4.4 = \mathbf{44\,cm^2}$
- Diagonale $|AC| = \sqrt{10^2 + 5.6^2} \approx \mathbf{11.46\,cm}$
- Diagonale $|BD| = \sqrt{10^2 + 3.2^2} \approx \mathbf{10.50\,cm}$

54. Planfigur: ($|DC| = |DF|$)



- $|AF| = \sqrt{10^2 - 8^2} = 6\,\text{cm}$
- $|FG| = 8\,\text{cm}$
- $|GB| = \sqrt{17^2 - 8^2} = 15\,\text{cm}$
- Umfang $u = 6 + 8 + 15 + 17 + 8 + 10 = \mathbf{64\,cm}$

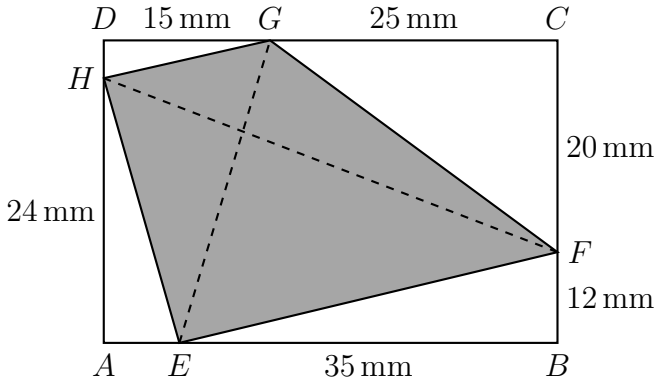
55. Abstand der Gitternetzlinien: 1 cm



- $|AB| = \sqrt{8^2 + 1^2} = \sqrt{65}$
- $|BC| = \sqrt{4^2 + 1^2} = \sqrt{17}$
- $|CD| = \sqrt{2^2 + 8^2} = \sqrt{68}$
- $|DE| = \sqrt{5^2 + 3^2} = \sqrt{34}$
- $|EF| = \sqrt{3^2 + 3^2} = \sqrt{18}$
- $|FG| = \sqrt{2^2 + 1^2} = \sqrt{5}$
- $|GH| = \sqrt{3^2 + 2^2} = \sqrt{13}$
- $|HJ| = \sqrt{1^2 + 3^2} = \sqrt{10}$
- $|JK| = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$
- $|KA| = \sqrt{6^2 + 3^2} = \sqrt{45}$

$u = |AB| + |BC| + \cdots + |KA| = \mathbf{51.22\,cm}$

56. Planfigur:



- $|EF| = \sqrt{35^2 + 12^2} = 37\,\text{mm}$
  $|FG| = \sqrt{20^2 + 25^2} \approx 32.02\,\text{mm}$
  $|GH| = \sqrt{15^2 + 8^2} = 17\,\text{mm}$
  $|HE| = \sqrt{24^2 + 5^2} \approx 24.52\,\text{mm}$
  $u = |EF| + |FG| + |GH| + |HE| \approx \mathbf{110.53\,mm}$

- Diagonalen:
  $|EG| = \sqrt{10^2 + 32^2} = \mathbf{33.53\,mm}$
  $|HF| = \sqrt{40^2 + 12^2} = \mathbf{41.76\,mm}$

- Flächenininhalt:
  $$A_{ABCD} = 40 \cdot 32 - \frac{35 \cdot 12}{2} - \frac{20 \cdot 25}{2} - \frac{15 \cdot 8}{2} - \frac{24 \cdot 5}{2}$$
  $$= 1280 - 210 - 250 - 60 - 60 = \mathbf{700\,mm^2}$$