

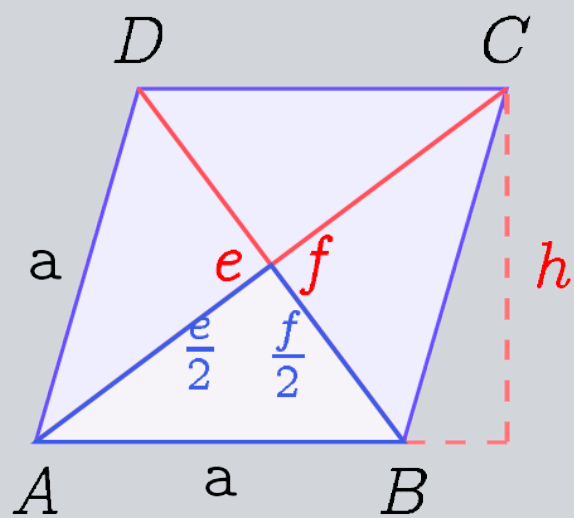
MATHEMATIK

Aufgabensammlung mit vollständigen Lösungen

Planimetrie II

Berechnungen am Viereck

50



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1

Problems

1.1 Gleichungssysteme

1.1.1 Quadrat, Rechteck

Text undefined 1 ...

1 $a = 87 \text{ mm}, b = 81 \text{ mm}.$

2 $a = 83 \text{ mm}, b = 68 \text{ mm}.$

3 $a = 73 \text{ mm}, A = 4380 \text{ mm}^2.$

4 $b = 54 \text{ mm}, A = 4536 \text{ mm}^2.$

5 $a = 86 \text{ mm}, U = 334 \text{ mm}.$

6 $b = 84 \text{ mm}, U = 292 \text{ mm}.$

7 $a = 68 \text{ mm}, d = 86 \text{ mm}.$

8 $b = 76 \text{ mm}, d = 101 \text{ mm}.$

9 $a = 40 \text{ mm}, b = 73 \text{ mm}.$

10 $a = 72 \text{ mm}, b = 49 \text{ mm}.$

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1.1.2 Parallelogramm

Text undefined 1 ...

11 $a = 70 \text{ mm}, b = 53 \text{ mm}, h_a = 37.5 \text{ mm}.$

12 $a = 48 \text{ mm}, b = 78 \text{ mm}, A = 2565.4 \text{ mm}^2.$

13 $a = 46 \text{ mm}, b = 49 \text{ mm}, h_b = 39.2 \text{ mm}.$

14 $a = 73 \text{ mm}, b = 43 \text{ mm}, A = 2185.4 \text{ mm}^2.$

15 $b = 78 \text{ mm}, e = 107.8 \text{ mm}, h_a = 69.5 \text{ mm}.$

16 $b = 59 \text{ mm}, f = 81.9 \text{ mm}, h_a = 58.4 \text{ mm}.$

17 $a = 63 \text{ mm}, h_b = 46.8 \text{ mm}, A = 3132.6 \text{ mm}^2.$

18 $a = 41 \text{ mm}, b = 63 \text{ mm}, f = 41.7 \text{ mm}.$

19 $a = 73 \text{ mm}, b = 49 \text{ mm}, h_a = 30.4 \text{ mm}.$

20 $a = 46 \text{ mm}, b = 69 \text{ mm}, A = 2060.4 \text{ mm}^2.$

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1.1.3 Rhombus

Text undefined 1 ...

21 $e = 107.2 \text{ mm}, f = 62.3 \text{ mm}.$

22 $a = 46 \text{ mm}, e = 74.3 \text{ mm}.$

23 $a = 49 \text{ mm}, f = 35.0 \text{ mm}.$

24 $a = 79 \text{ mm}, h = 62.4 \text{ mm}.$

25 $a = 69 \text{ mm}, A = 4451.6 \text{ mm}^2.$

26 $e = 114.6 \text{ mm}, A = 4404.6 \text{ mm}^2.$

27 $e = 123.0 \text{ mm}, h = 77.2 \text{ mm}.$

28 $A = 1566.4 \text{ mm}^2, U = 168 \text{ mm}.$

29 $e = 134.5 \text{ mm}, f = 79.1 \text{ mm}.$

30 $a = 41 \text{ mm}, e = 76.0 \text{ mm}.$

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1.1.4 Allgemeines Trapez

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31 $a = 79 \text{ mm}, b = 46.6 \text{ mm}, c = 49 \text{ mm}, d = 51.2 \text{ mm}.$

32 $a = 83 \text{ mm}, b = 48.3 \text{ mm}, d = 63.9 \text{ mm}, f = 58.7 \text{ mm}.$

33 $a = 65 \text{ mm}, c = 39 \text{ mm}, d = 46.3 \text{ mm}, f = 64.3 \text{ mm}.$

34 $a = 72 \text{ mm}, c = 24 \text{ mm}, d = 54.2 \text{ mm}, e = 70.5 \text{ mm}.$

35 $a = 82 \text{ mm}, c = 43 \text{ mm}, f = 70.2 \text{ mm}, A = 2999.9 \text{ mm}^2.$

36 $a = 61 \text{ mm}, c = 27 \text{ mm}, d = 48.8 \text{ mm}, h = 43.0 \text{ mm}.$

37 $b = 51.0 \text{ mm}, c = 34 \text{ mm}, d = 55.0 \text{ mm}, f = 68.6 \text{ mm}.$

38 $a = 73 \text{ mm}, d = 47.5 \text{ mm}, f = 63.9 \text{ mm}, A = 2234.6 \text{ mm}^2.$

39 $a = 84 \text{ mm}, b = 45.6 \text{ mm}, c = 36 \text{ mm}, d = 56.9 \text{ mm}.$

40 $a = 64 \text{ mm}, b = 46.9 \text{ mm}, d = 53.5 \text{ mm}, f = 57.0 \text{ mm}.$

41 $a = 65 \text{ mm}, c = 34 \text{ mm}, d = 47.7 \text{ mm}, f = 59.7 \text{ mm}.$

42 $a = 62 \text{ mm}, c = 35 \text{ mm}, d = 44.0 \text{ mm}, e = 66.7 \text{ mm}.$

43 $a = 61 \text{ mm}, c = 27 \text{ mm}, f = 55.1 \text{ mm}, A = 1892.1 \text{ mm}^2.$

44 $a = 65 \text{ mm}, c = 21 \text{ mm}, d = 52.1 \text{ mm}, h = 43.0 \text{ mm}.$

1.1.5 Gleichschenkeliges Trapez

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- 45 $a = 62 \text{ mm}, b = 51.6 \text{ mm}, h = 48.0 \text{ mm}.$
- 46 $a = 85 \text{ mm}, b = 49 \text{ mm}, c = 38 \text{ mm}.$
- 47 $a = 66 \text{ mm}, b = 43.4 \text{ mm}, U = 196.8 \text{ mm}.$
- 48 $a = 76 \text{ mm}, c = 24 \text{ mm}, A = 2349.9 \text{ mm}^2.$
- 49 $b = 49.2 \text{ mm}, c = 47 \text{ mm}, h = 46.0 \text{ mm}.$
- 50 $c = 38 \text{ mm}, e = 76.3 \text{ mm}, h = 43.0 \text{ mm}.$
- 51 $a = 87 \text{ mm}, e = 76.7 \text{ mm}, h = 40.0 \text{ mm}.$
- 52 $a = 61 \text{ mm}, b = 47.9 \text{ mm}, e = 66.1 \text{ mm}.$
- 53 $a = 84 \text{ mm}, b = 46.1 \text{ mm}, h = 41.0 \text{ mm}.$
- 54 $a = 77 \text{ mm}, b = 54.8 \text{ mm}, c = 24 \text{ mm}.$
- 55 $a = 75 \text{ mm}, b = 44.6 \text{ mm}, U = 209.2 \text{ mm}.$
- 56 $a = 69 \text{ mm}, c = 42 \text{ mm}, A = 2441.7 \text{ mm}^2.$
- 57 $b = 51.1 \text{ mm}, c = 33 \text{ mm}, h = 49.0 \text{ mm}.$
- 58 $c = 47 \text{ mm}, e = 79.0 \text{ mm}, h = 49.0 \text{ mm}.$

2

Solutions

2.1 Gleichungssysteme

2.1.1 Quadrat, Rechteck

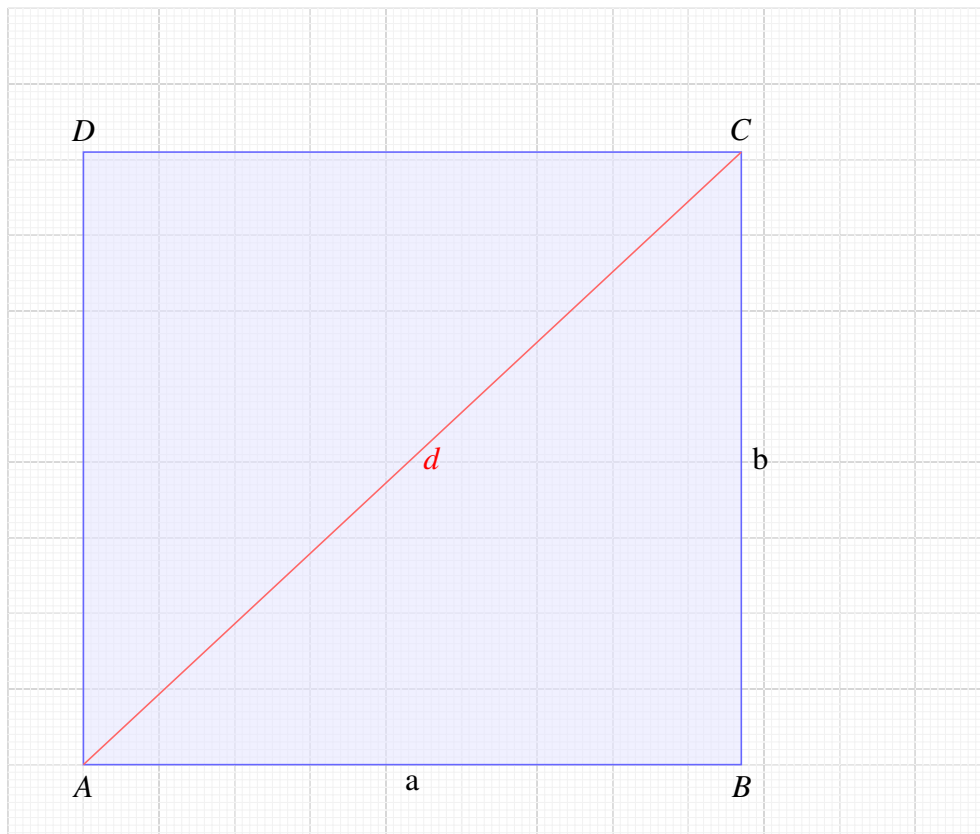
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1

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1 $a = 87 \text{ mm}, b = 81 \text{ mm}.$



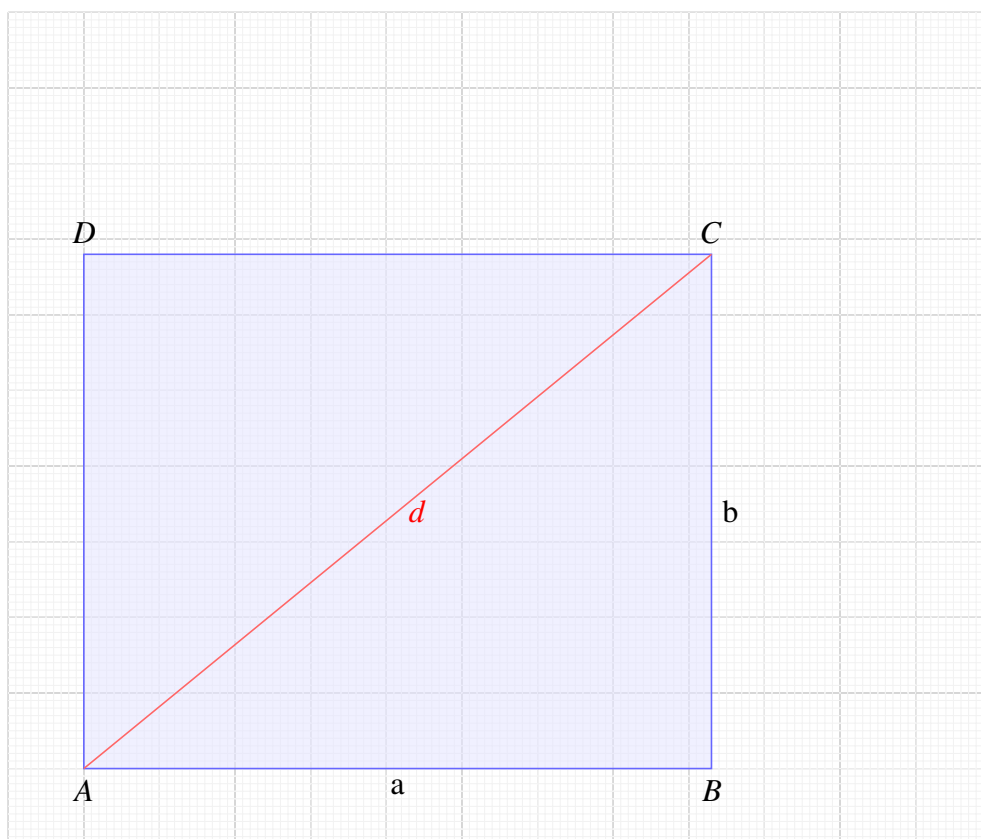
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{87^2 + 81^2} = \underline{118.9 \text{ mm}}$$

$$A = a \cdot b = 87 \cdot 81 = \underline{7047 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (87 + 81) = \underline{336 \text{ mm}}$$

2 $a = 83 \text{ mm}, b = 68 \text{ mm}.$



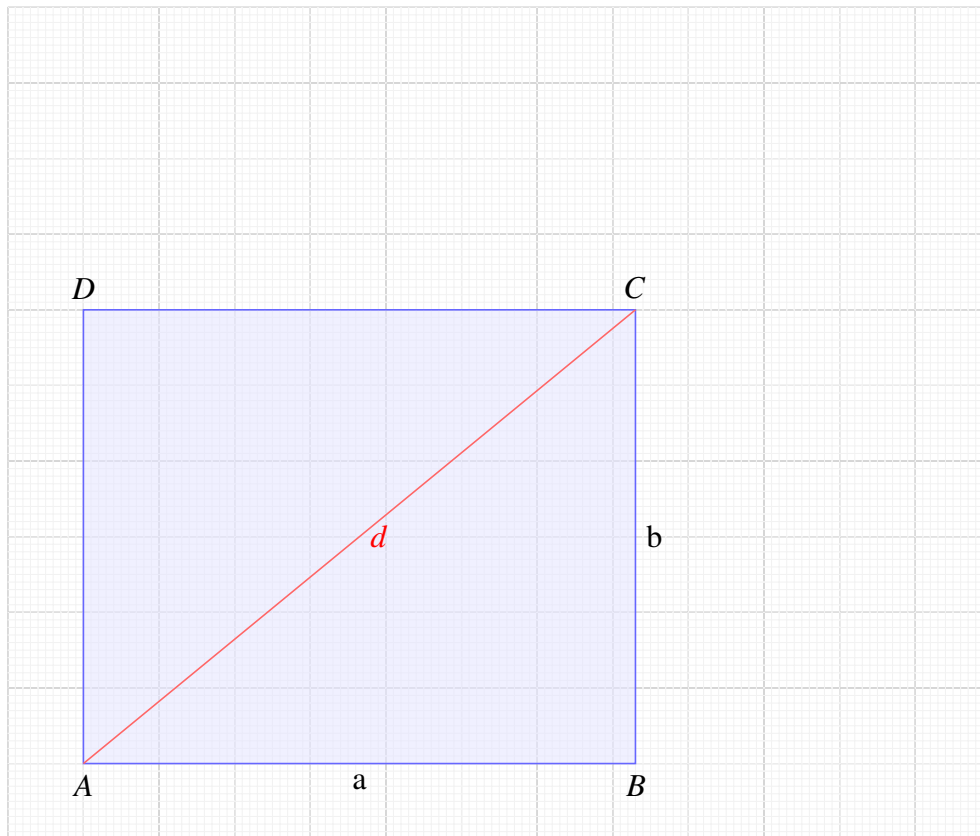
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{83^2 + 68^2} = \underline{107.3 \text{ mm}}$$

$$A = a \cdot b = 83 \cdot 68 = \underline{5644 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (83 + 68) = \underline{302 \text{ mm}}$$

3 $a = 73 \text{ mm}, A = 4380 \text{ mm}^2.$



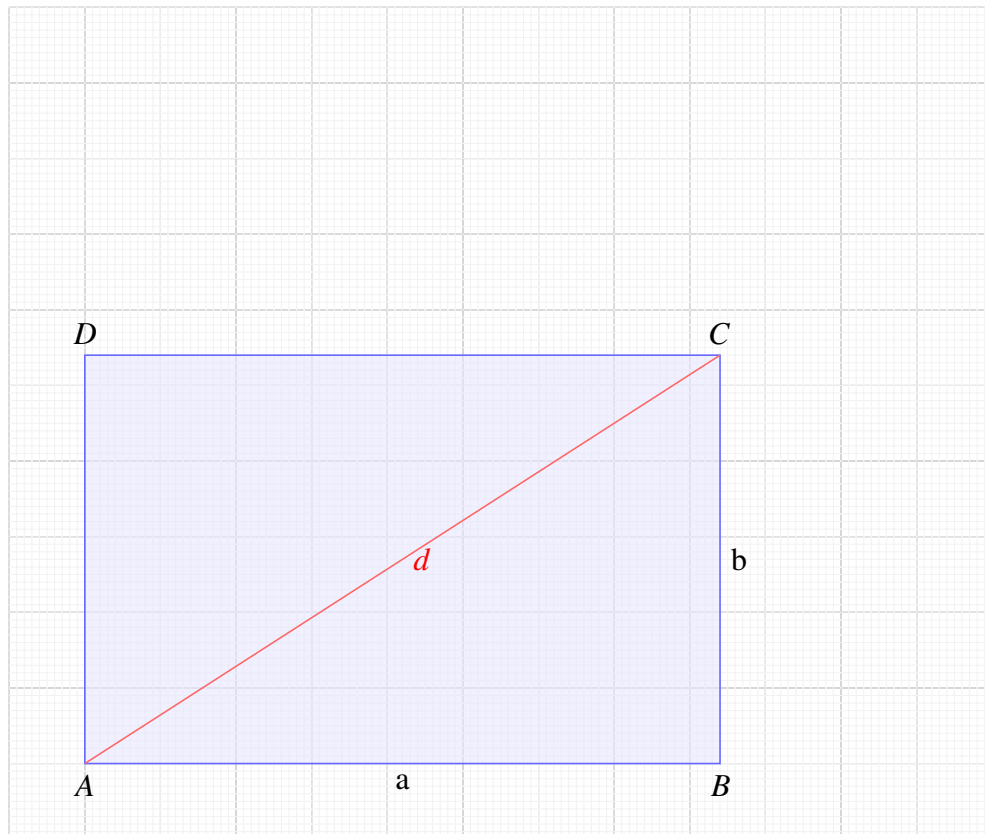
$$A = a \cdot b \Rightarrow b = \frac{A}{a} = \frac{4380}{73} = \underline{60 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{73^2 + 60^2} = \underline{94.5 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (73 + 60) = \underline{266 \text{ mm}}$$

4 $b = 54 \text{ mm}, A = 4536 \text{ mm}^2.$



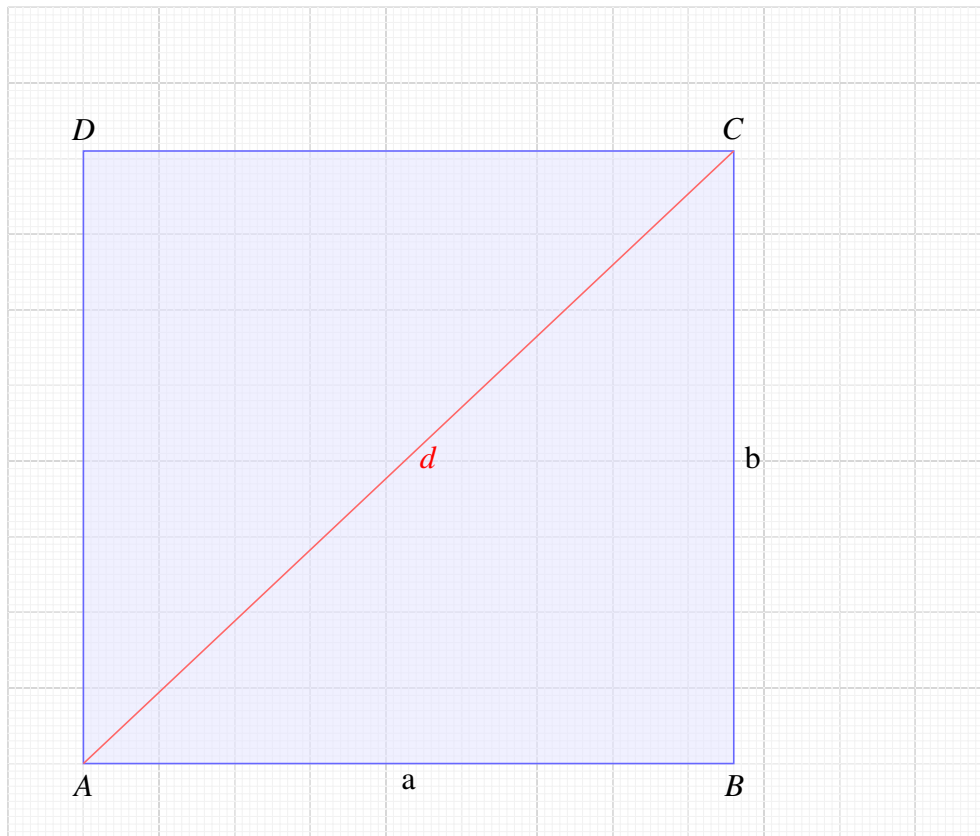
$$A = a \cdot b \Rightarrow a = \frac{A}{b} = \frac{4536}{54} = \underline{84 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{84^2 + 54^2} = \underline{99.9 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (84 + 54) = \underline{276 \text{ mm}}$$

5 $a = 86 \text{ mm}$, $U = 334 \text{ mm}$.



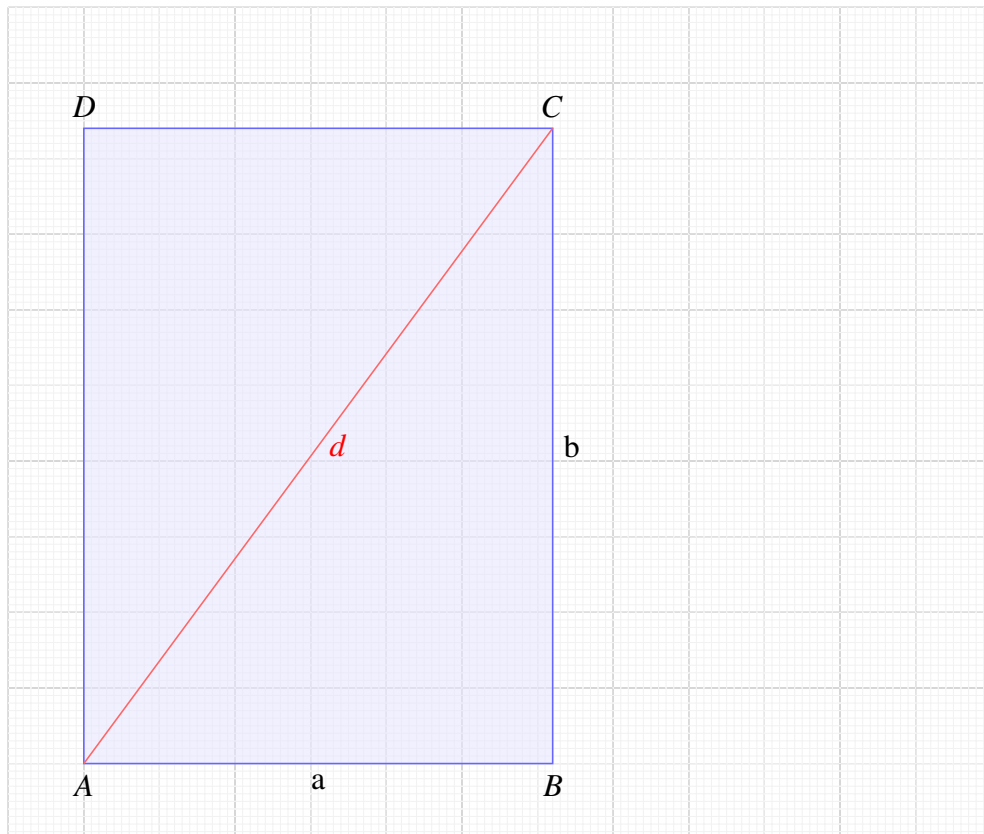
$$U = 2 \cdot (a + b) \Rightarrow b = \frac{U}{2} - a = \frac{334}{2} - 86 = \underline{81 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{86^2 + 81^2} = \underline{118.1 \text{ mm}}$$

$$A = a \cdot b = 86 \cdot 81 = \underline{6966 \text{ mm}}$$

6 $b = 84 \text{ mm}, U = 292 \text{ mm}.$



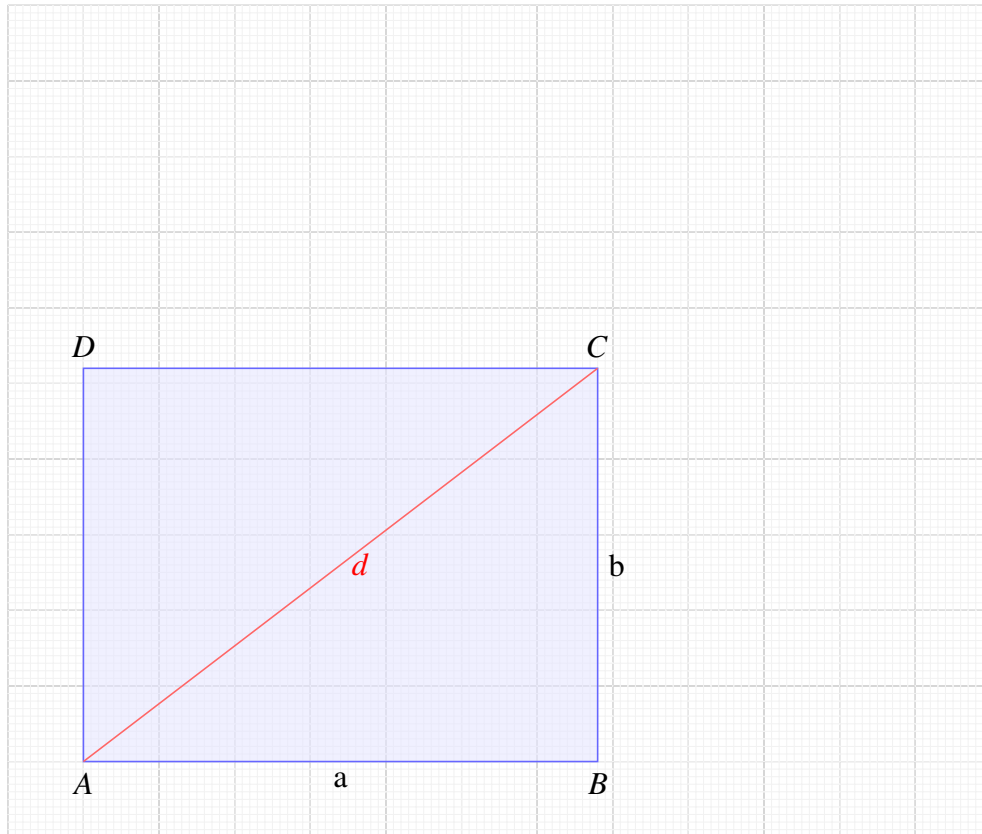
$$U = 2 \cdot (a + b) \Rightarrow a = \frac{U}{2} - b = \frac{292}{2} - 84 = \underline{62 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{62^2 + 84^2} = \underline{104.4 \text{ mm}}$$

$$A = a \cdot b = 62 \cdot 84 = \underline{5208 \text{ mm}}$$

7 $a = 68 \text{ mm}, d = 86 \text{ mm}.$



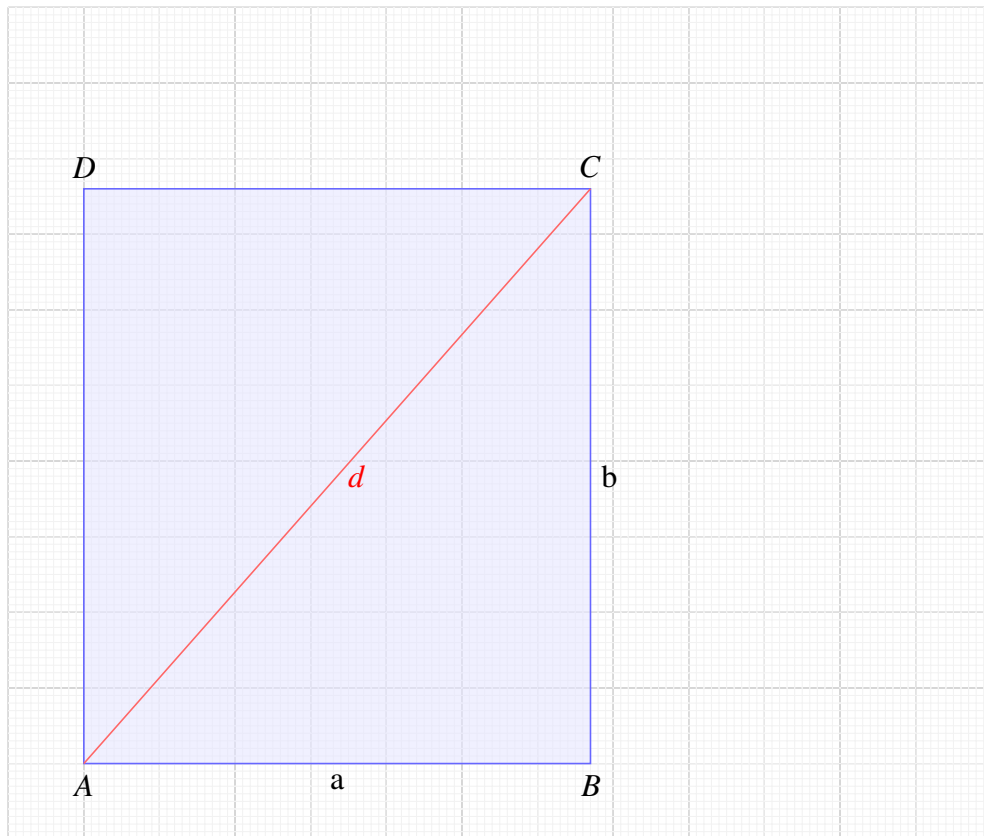
Phytagoras

$$b = \sqrt{d^2 - a^2} = \sqrt{85.6^2 - 68^2} = \underline{52 \text{ mm}}$$

$$A = a \cdot b = 68 \cdot 52 = \underline{3536 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (68 + 52) = \underline{240 \text{ mm}}$$

8 $b = 76 \text{ mm}$, $d = 101 \text{ mm}$.



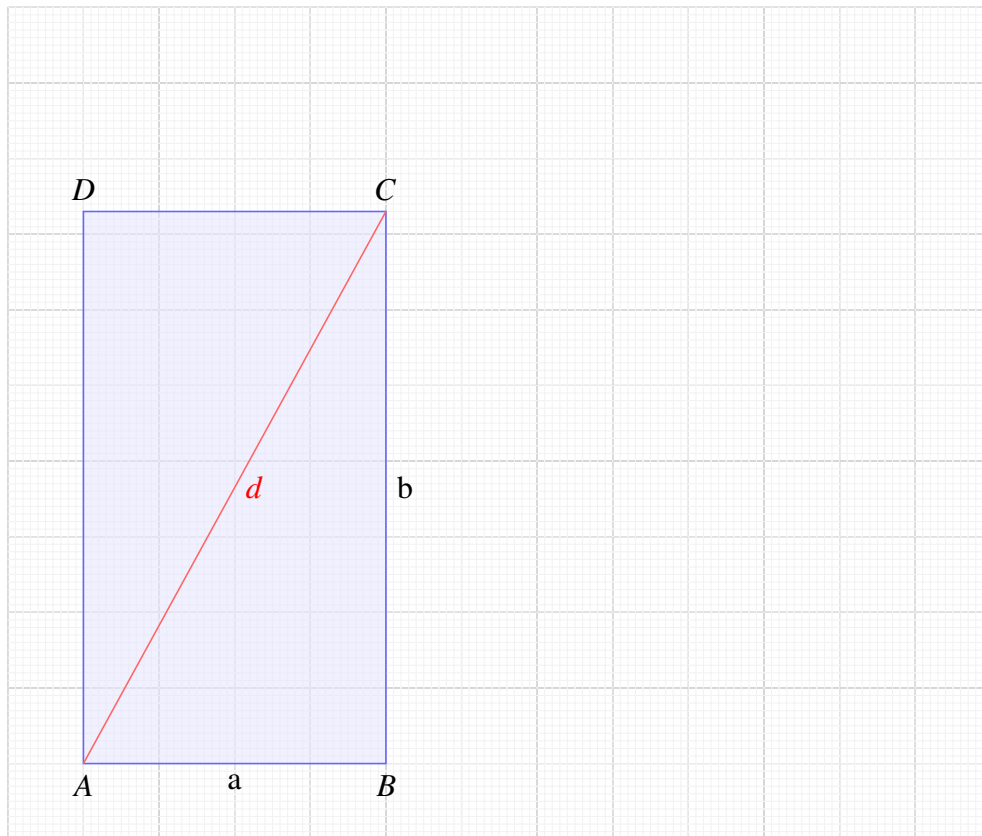
Phytagoras

$$a = \sqrt{d^2 - b^2} = \sqrt{101.3^2 - 76^2} = \underline{67 \text{ mm}}$$

$$A = a \cdot b = 67 \cdot 76 = \underline{5092 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (67 + 76) = \underline{286 \text{ mm}}$$

9 $a = 40 \text{ mm}, b = 73 \text{ mm}.$



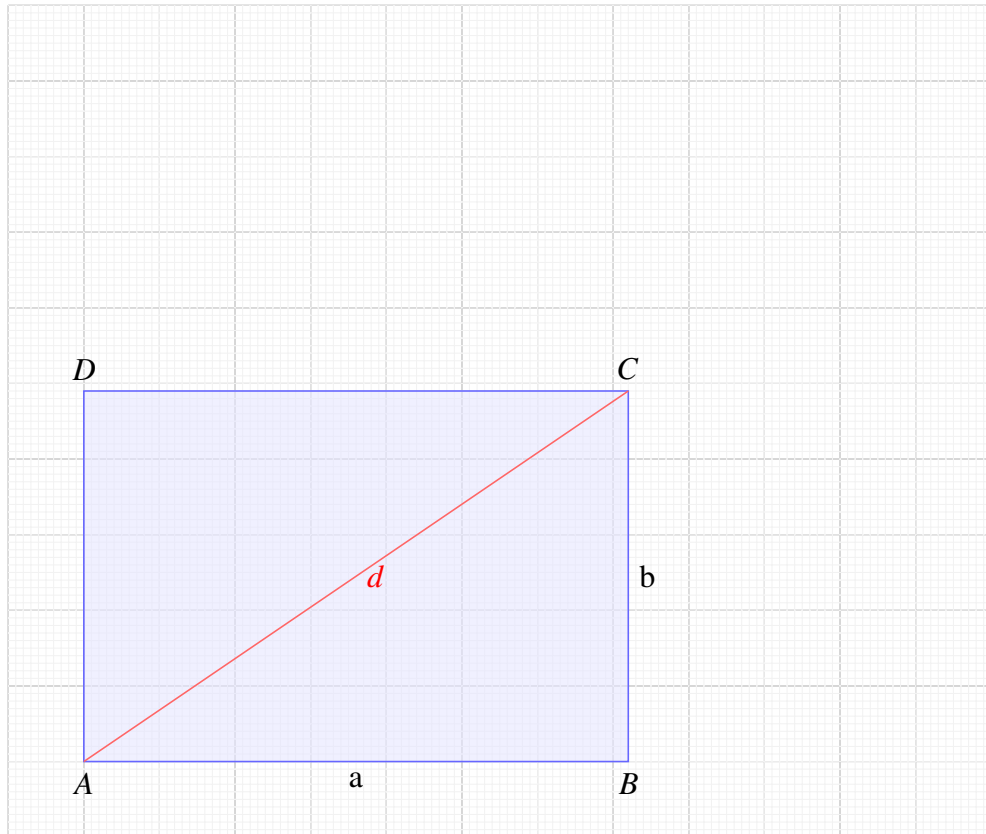
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{40^2 + 73^2} = \underline{83.2 \text{ mm}}$$

$$A = a \cdot b = 40 \cdot 73 = \underline{2920 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (40 + 73) = \underline{226 \text{ mm}}$$

10 $a = 72 \text{ mm}, b = 49 \text{ mm}.$



Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{72^2 + 49^2} = \underline{87.1 \text{ mm}}$$

$$A = a \cdot b = 72 \cdot 49 = \underline{3528 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (72 + 49) = \underline{242 \text{ mm}}$$

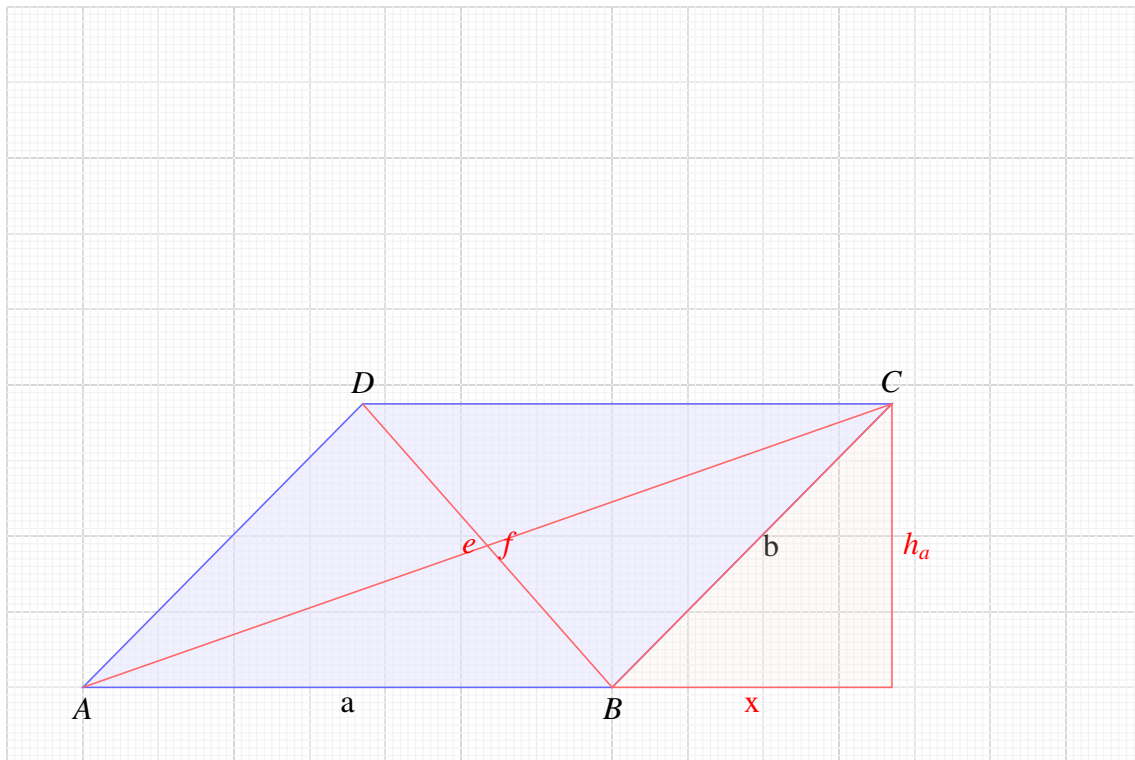
2.1.2 Parallelogramm

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11 $a = 70 \text{ mm}$, $b = 53 \text{ mm}$, $h_a = 37.5 \text{ mm}$.



$$A = a \cdot h_a = 70 \cdot 37.5 = \underline{2624 \text{ mm}^2}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{53^2 - 37.5^2} = 37.5 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

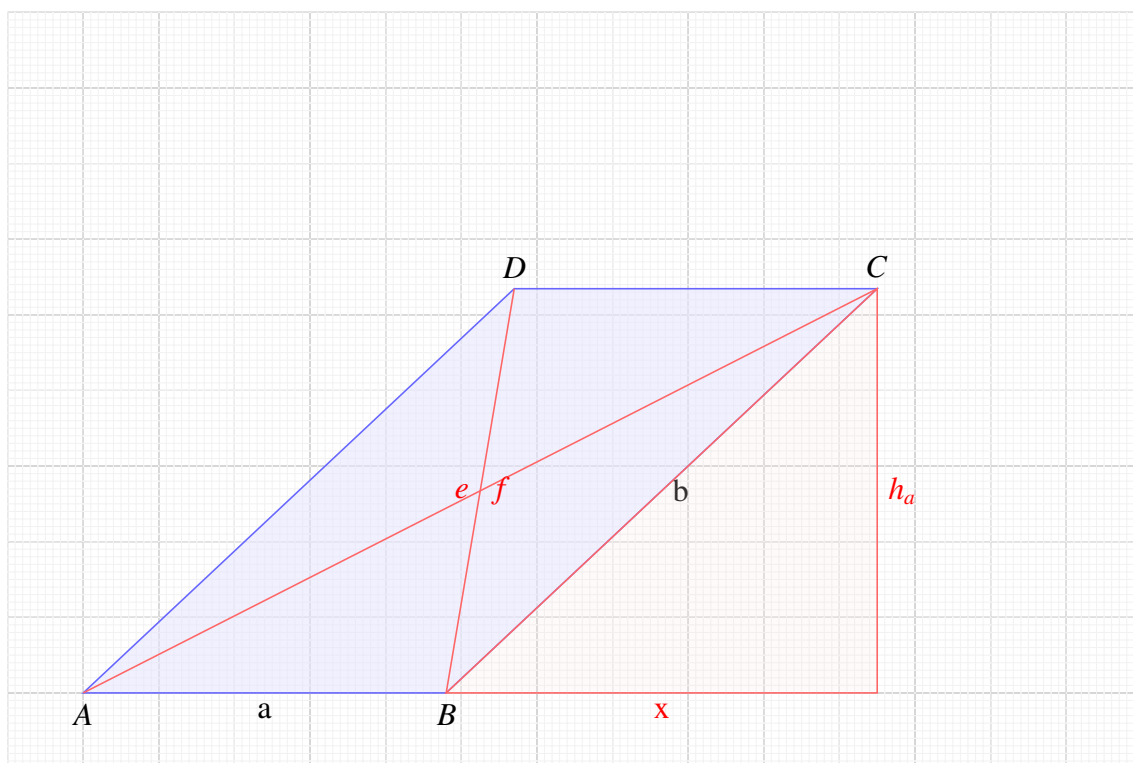
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{37.5^2 + (70 + 37.5)^2} = \underline{113.8 \text{ mm}}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{37.5^2 + (70 - 37.5)^2} = \underline{49.6 \text{ mm}}$$

12 $a = 48 \text{ mm}, b = 78 \text{ mm}, A = 2565.4 \text{ mm}^2.$



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2565.4}{48} = \underline{53.4 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2565.4}{78} = \underline{32.9 \text{ mm}}$$

Phytgoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{78^2 - 53.4^2} = 56.8 \text{ mm}$$

Phytgoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

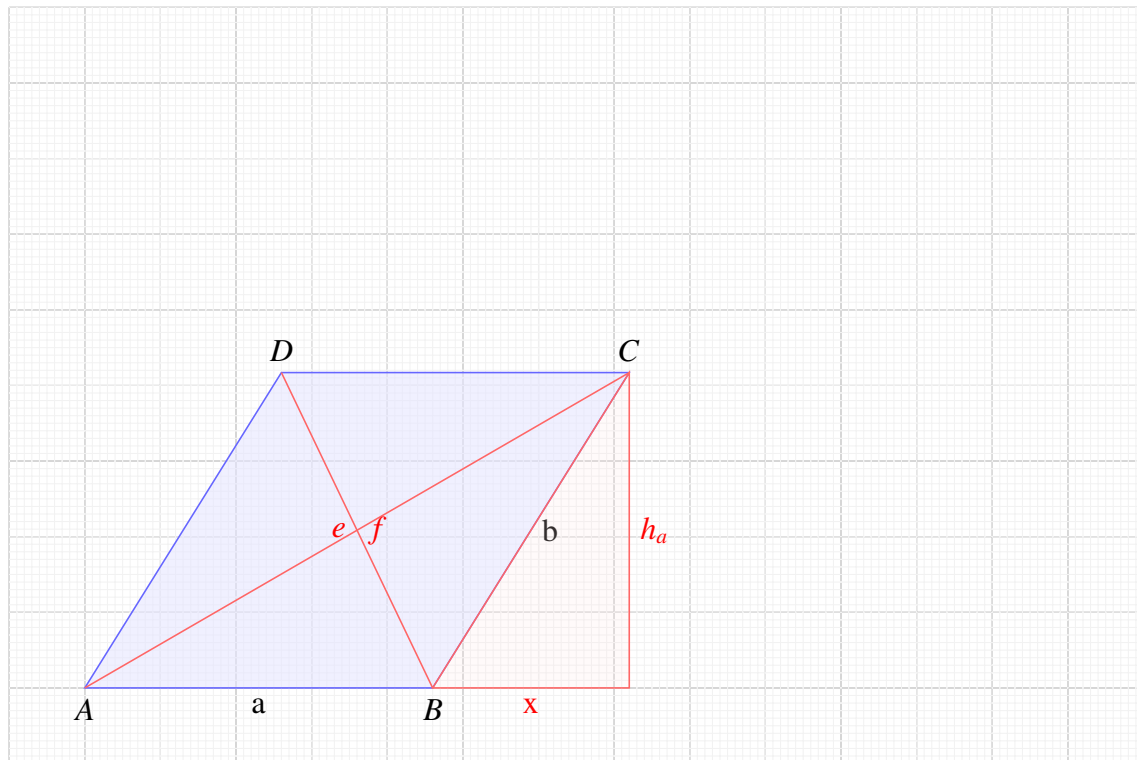
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{53.4^2 + (48 + 56.8)^2} = \underline{117.7 \text{ mm}}$$

Phytgoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{53.4^2 + (48 - 56.8)^2} = \underline{54.2 \text{ mm}}$$

13 $a = 46 \text{ mm}, b = 49 \text{ mm}, h_b = 39.2 \text{ mm}.$



$$A = b \cdot h_b = 49 \cdot 39.2 = \underline{1918.4 \text{ mm}^2}$$

$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{1918.4}{46} = \underline{41.7 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{49^2 - 41.7^2} = 25.7 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

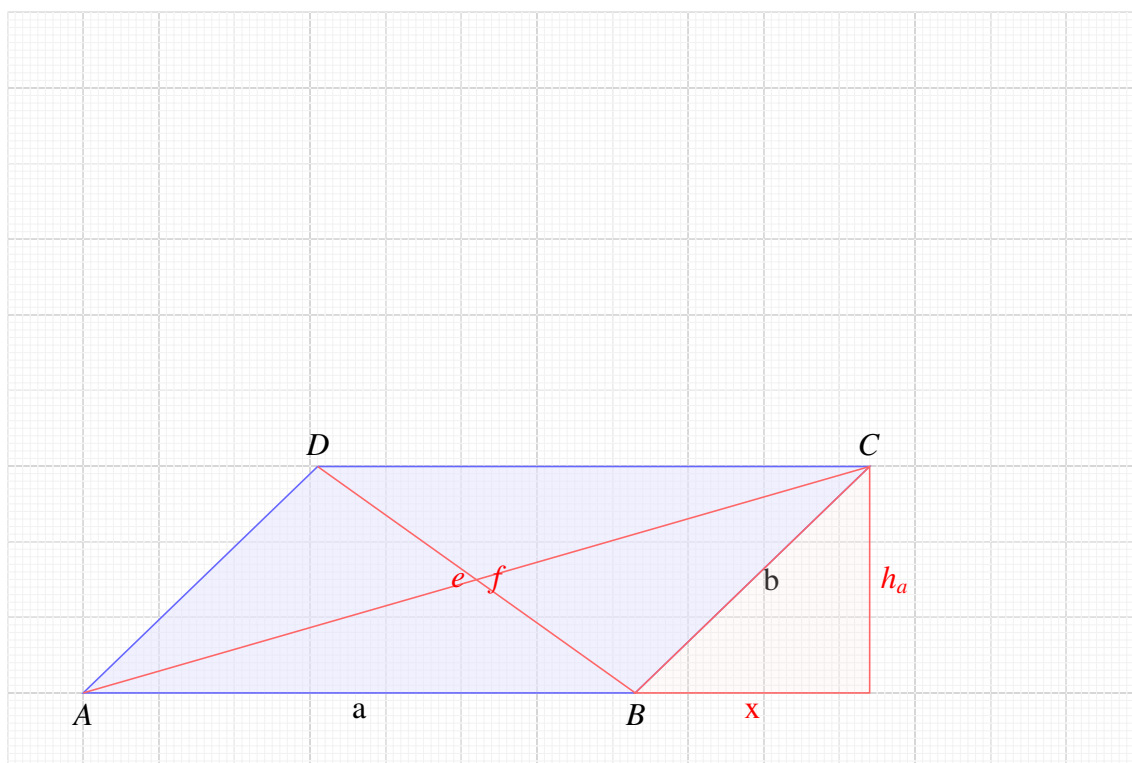
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{41.7^2 + (46 + 25.7)^2} = \underline{83.0 \text{ mm}}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{41.7^2 + (46 - 25.7)^2} = \underline{46.4 \text{ mm}}$$

14 $a = 73 \text{ mm}, b = 43 \text{ mm}, A = 2185.4 \text{ mm}^2$.



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2185.4}{73} = \underline{29.9 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2185.4}{43} = \underline{50.8 \text{ mm}}$$

Phytgoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{43^2 - 29.9^2} = 30.9 \text{ mm}$$

Phytgoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

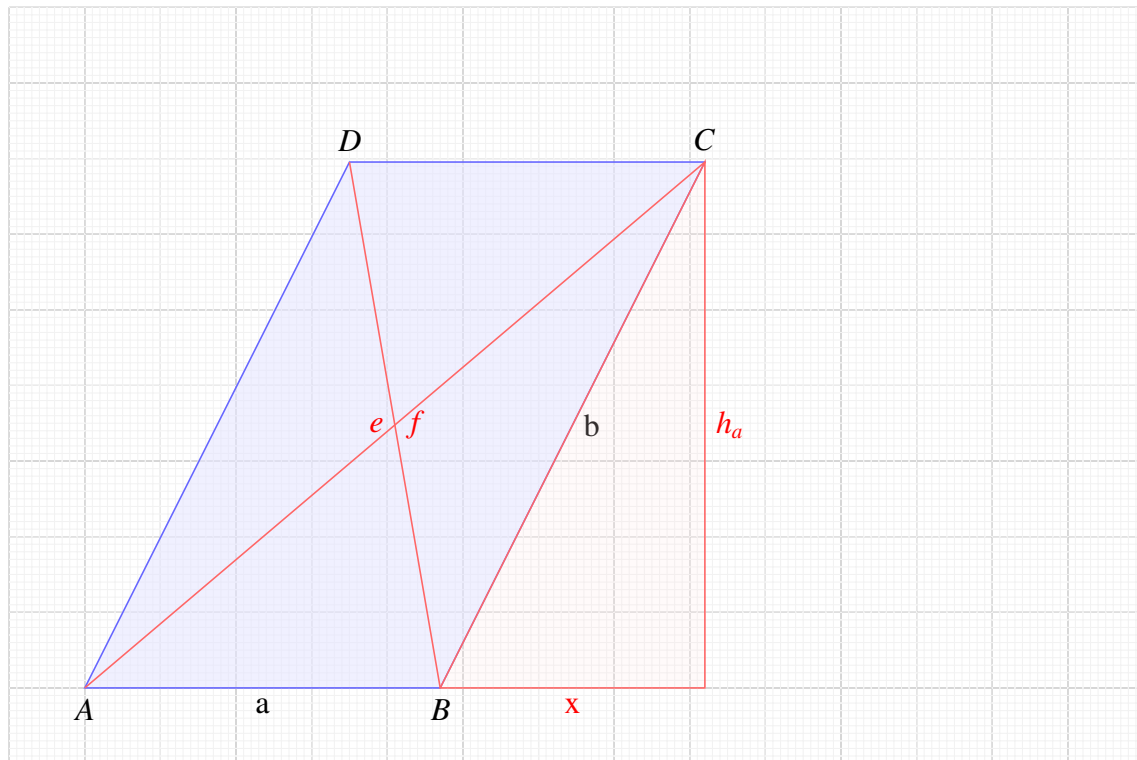
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{29.9^2 + (73 + 30.9)^2} = \underline{108.1 \text{ mm}}$$

Phytgoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{29.9^2 + (73 - 30.9)^2} = \underline{51.7 \text{ mm}}$$

15 $b = 78 \text{ mm}$, $e = 107.8 \text{ mm}$, $h_a = 69.5 \text{ mm}$.



Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{78^2 - 69.5^2} = 35.3 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow a = \sqrt{e^2 - h_a^2} - x = \sqrt{107.8^2 - 69.5^2} - 35.3 = \underline{47 \text{ mm}}$$

$$A = a \cdot h_a = 47 \cdot 69.5 = \underline{3268.6 \text{ mm}^2}$$

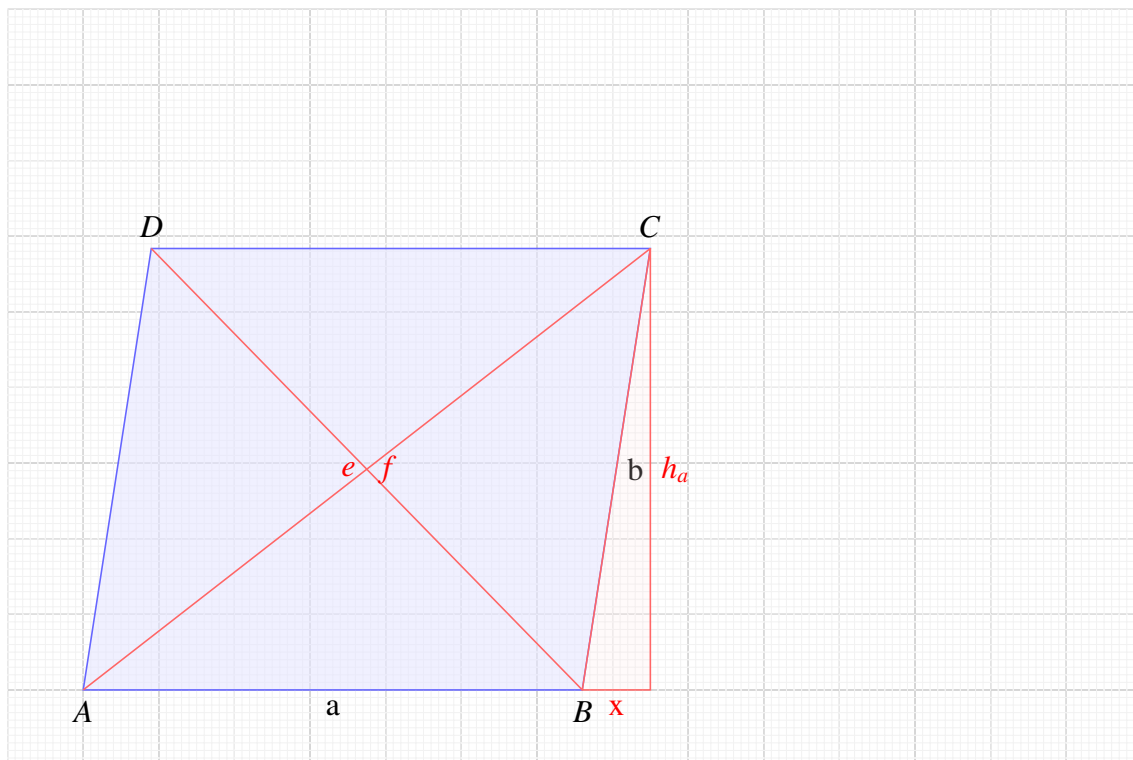
Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{69.5^2 + (47 - 35.3)^2} = \underline{70.5 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{3268.6}{78} = \underline{41.9 \text{ mm}}$$

16 $b = 59 \text{ mm}$, $f = 81.9 \text{ mm}$, $h_a = 58.4 \text{ mm}$.



Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{59^2 - 58.4^2} = 8.6 \text{ mm}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow a = \sqrt{f^2 - h_a^2} + x = \sqrt{81.9^2 - 58.4^2} + 8.6 = \underline{66 \text{ mm}}$$

$$A = a \cdot h_a = 66 \cdot 58.4 = \underline{3852.4 \text{ mm}^2}$$

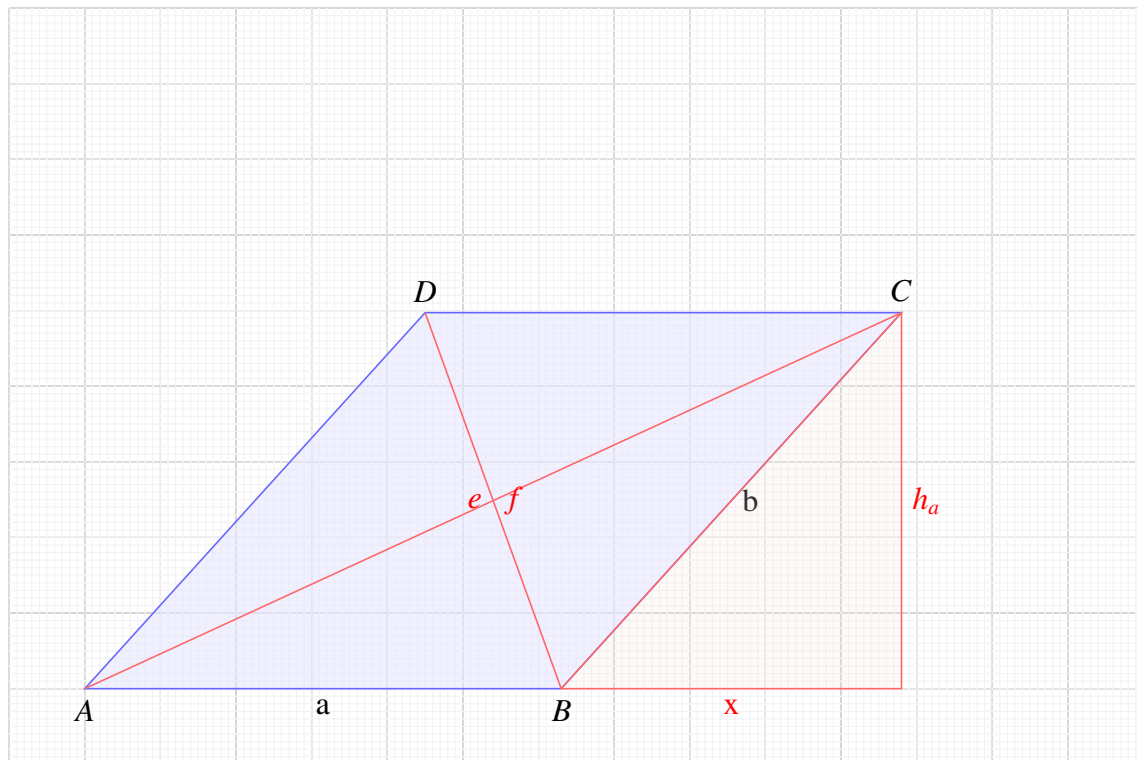
Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{58.4^2 + (66 + 8.6)^2} = \underline{94.7 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{3852.4}{59} = \underline{65.3 \text{ mm}}$$

$$17 \quad a = 63 \text{ mm}, h_b = 46.8 \text{ mm}, A = 3132.6 \text{ mm}^2.$$



$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b}$$

$$b = \frac{A}{h_b} = \frac{3132.6}{46.8} = \underline{67 \text{ mm}}$$

$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{3132.6}{63} = \underline{49.7 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{67^2 - 49.7^2} = 44.9 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

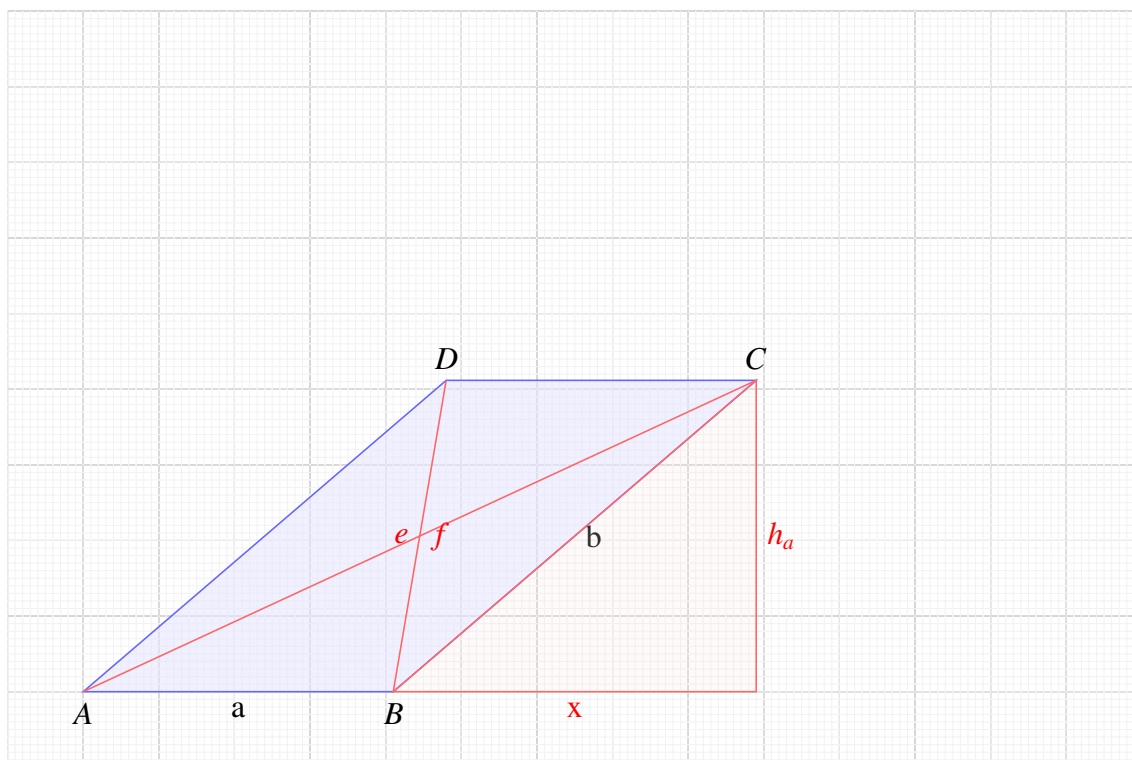
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{49.7^2 + (63 + 44.9)^2} = \underline{118.8 \text{ mm}}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{49.7^2 + (63 - 44.9)^2} = \underline{52.9 \text{ mm}}$$

18 $a = 41 \text{ mm}, b = 63 \text{ mm}, f = 41.7 \text{ mm}.$



$$f^2 = h_a^2 + (a - x)^2$$

$$b^2 = h_a^2 + x^2$$

$$f^2 - b^2 = (a - x)^2 - x^2$$

$$f^2 - b^2 = a^2 - 2ax + x^2 - x^2$$

$$f^2 - b^2 = a^2 - 2ax \Rightarrow x = \frac{a^2 + b^2 - f^2}{2 \cdot a} = \frac{41^2 + 63^2 - 41.7^2}{2 \cdot 41} = 47.7 \text{ mm}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow h_a = \sqrt{b^2 - x^2} = \sqrt{63^2 - 47.7^2} = \underline{41.2 \text{ mm}}$$

Phytagoras

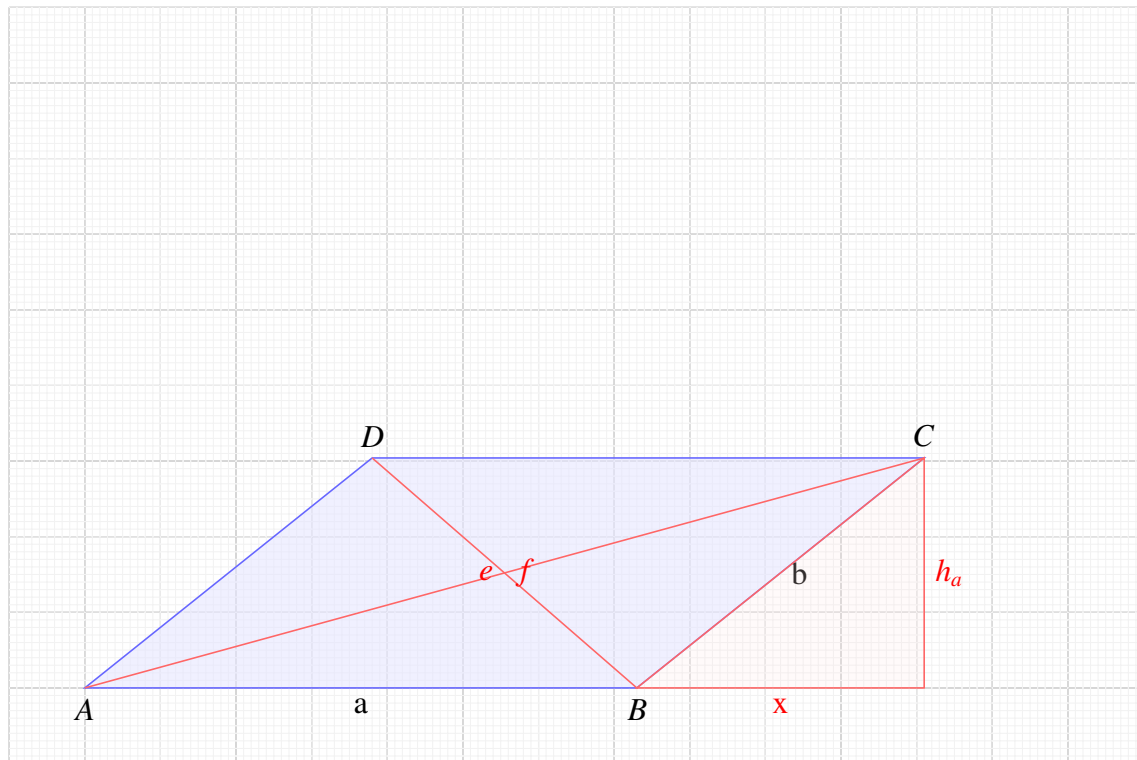
$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{41.2^2 + (41 + 47.7)^2} = \underline{97.8 \text{ mm}}$$

$$A = a \cdot h_a = 41 \cdot 41.2 = \underline{1687.8 \text{ mm}^2}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{1687.8}{63} = \underline{26.8 \text{ mm}}$$

19 $a = 73 \text{ mm}, b = 49 \text{ mm}, h_a = 30.4 \text{ mm}.$



$$A = a \cdot h_a = 73 \cdot 30.4 = \underline{2220.2 \text{ mm}^2}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{49^2 - 30.4^2} = 38.4 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

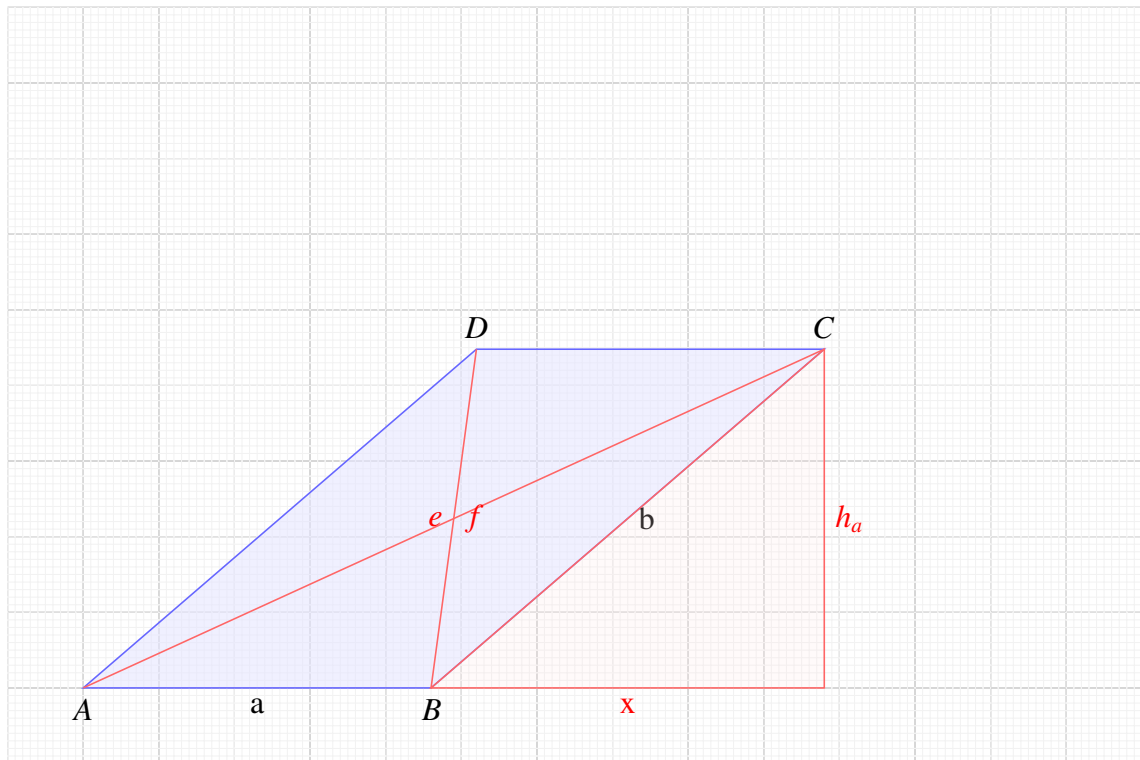
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{30.4^2 + (73 + 38.4)^2} = \underline{115.5 \text{ mm}}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{30.4^2 + (73 - 38.4)^2} = \underline{46.1 \text{ mm}}$$

20 $a = 46 \text{ mm}, b = 69 \text{ mm}, A = 2060.4 \text{ mm}^2.$



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2060.4}{46} = \underline{44.8 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2060.4}{69} = \underline{29.9 \text{ mm}}$$

Phytgoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{69^2 - 44.8^2} = 52.5 \text{ mm}$$

Phytgoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{44.8^2 + (46 + 52.5)^2} = \underline{108.2 \text{ mm}}$$

Phytgoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow f = \sqrt{h_a^2 + (a - x)^2}$$

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{44.8^2 + (46 - 52.5)^2} = \underline{45.3 \text{ mm}}$$

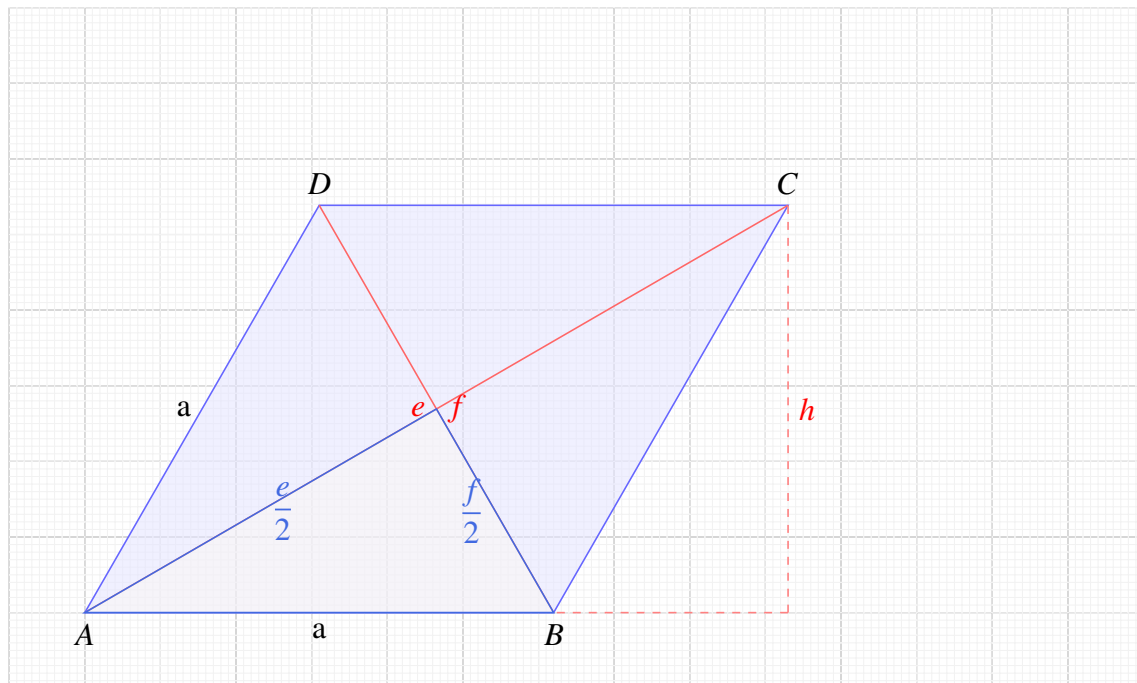
2.1.3 Rhombus

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$$21 \quad e = 107.2 \text{ mm}, f = 62.3 \text{ mm}.$$



Phytagoras

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

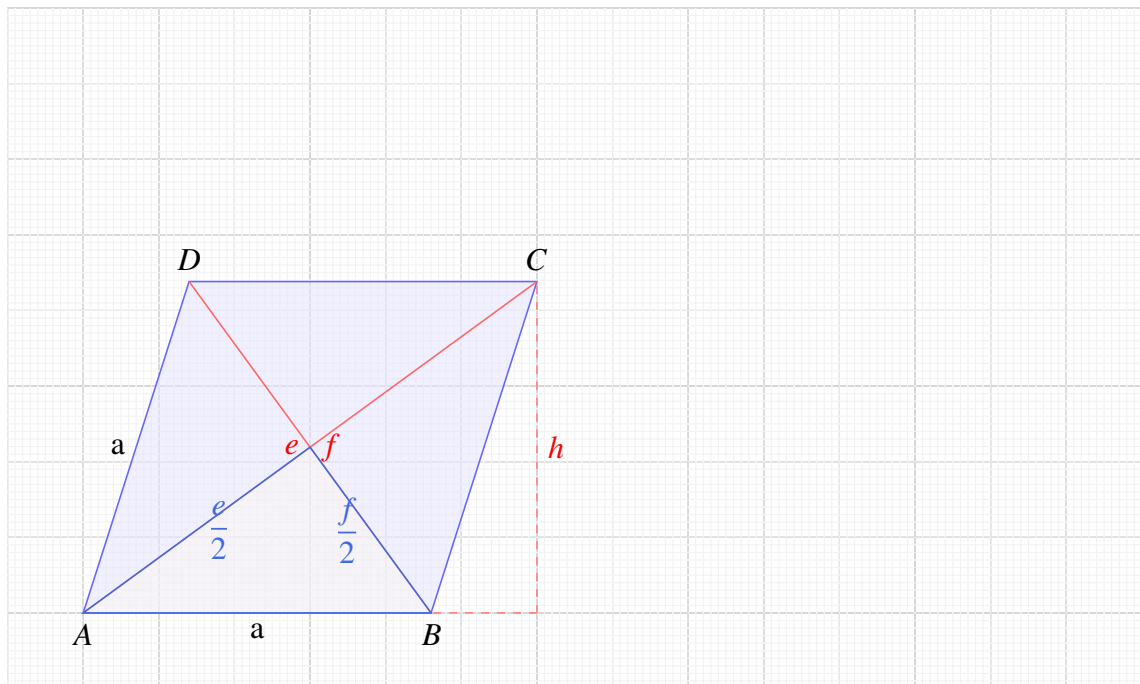
$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{107.2}{2}\right)^2 + \left(\frac{62.3}{2}\right)^2} = \underline{62 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{107.2 \cdot 62.3}{2} = \underline{3339.4 \text{ mm}^2}$$

$$A = a \cdot h \quad \Rightarrow \quad h = \frac{A}{a} = \frac{3339.4}{62} = \underline{53.9 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 62 = \underline{248 \text{ mm}}$$

22 $a = 46 \text{ mm}, e = 74.3 \text{ mm}.$



Phytagoras

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2 \Rightarrow \left(\frac{f}{2}\right)^2 = a^2 - \left(\frac{e}{2}\right)^2$$

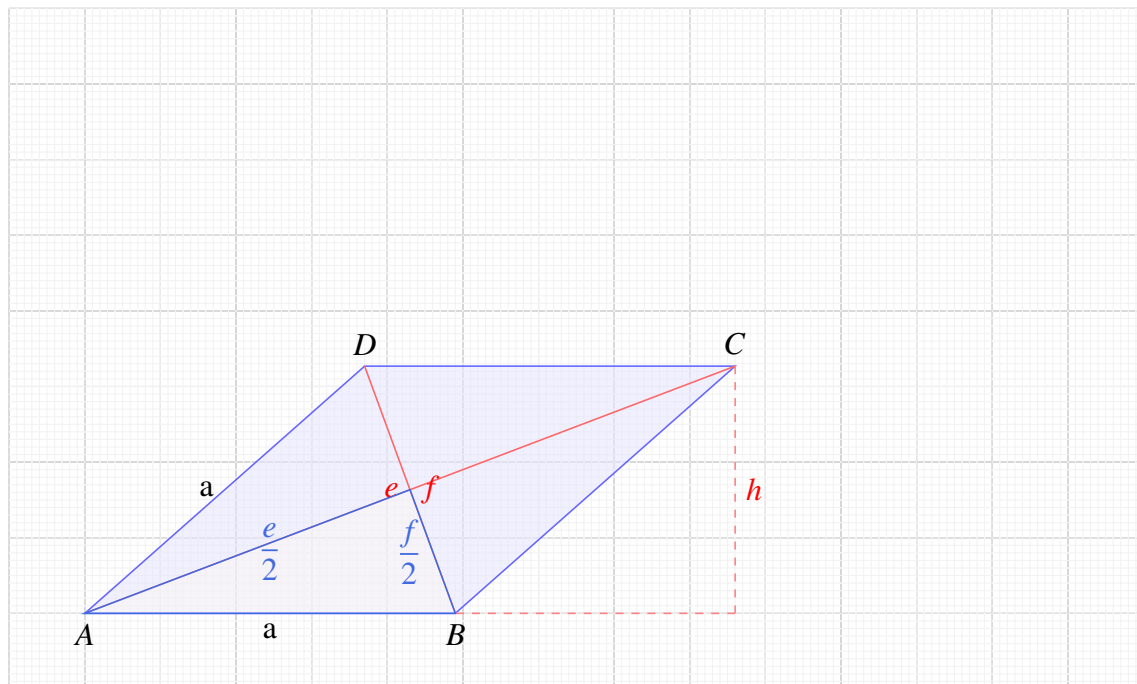
$$f = 2 \cdot \sqrt{a^2 - \left(\frac{e}{2}\right)^2} = 2 \cdot \sqrt{46^2 - \left(\frac{74.3}{2}\right)^2} = \underline{54.3 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{74.3 \cdot 54.3}{2} = \underline{2015.6 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2015.6}{46} = \underline{43.8 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 46 = \underline{184 \text{ mm}}$$

23 $a = 49 \text{ mm}, f = 35.0 \text{ mm}.$



Phytagoras

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2 \Rightarrow \left(\frac{e}{2}\right)^2 = a^2 - \left(\frac{f}{2}\right)^2$$

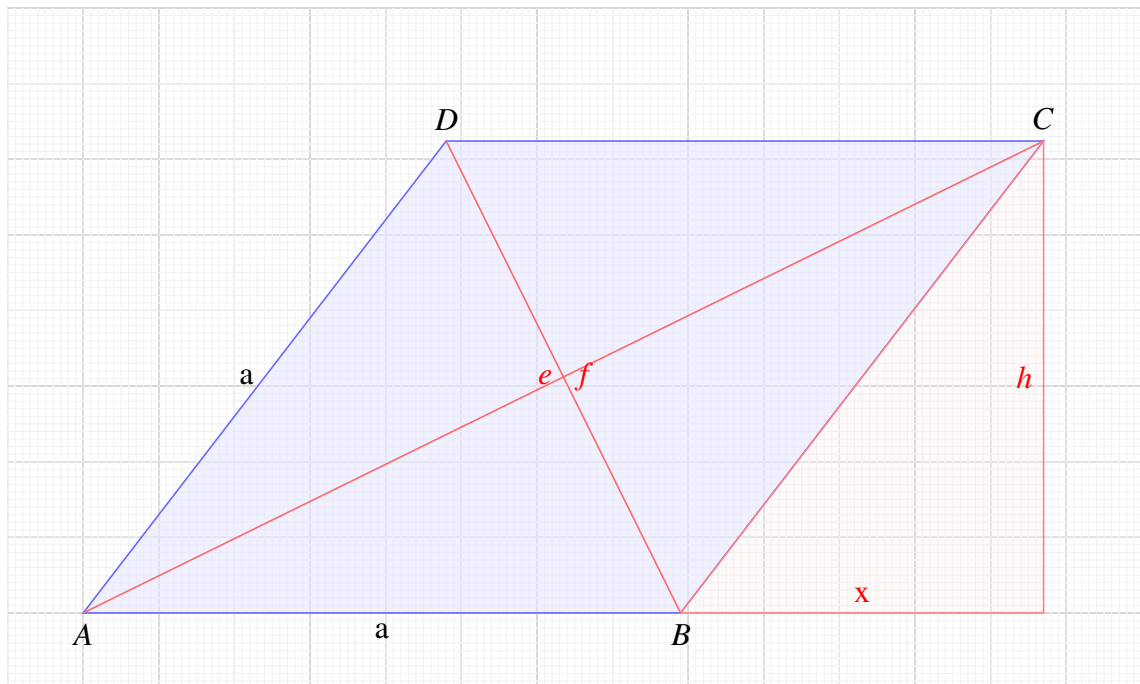
$$e = 2 \cdot \sqrt{a^2 - \left(\frac{f}{2}\right)^2} = 2 \cdot \sqrt{49^2 - \left(\frac{35.0}{2}\right)^2} = \underline{91.5 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{91.5 \cdot 35.0}{2} = \underline{1601.6 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{1601.6}{49} = \underline{32.7 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 49 = \underline{196 \text{ mm}}$$

24 $a = 79 \text{ mm}, h = 62.4 \text{ mm}.$



$$A = a \cdot h = 79 \cdot 62.4 = \underline{4929.6 \text{ mm}^2}$$

Phytagoras

$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{79^2 - 62.4^2} = 48.4 \text{ mm}$$

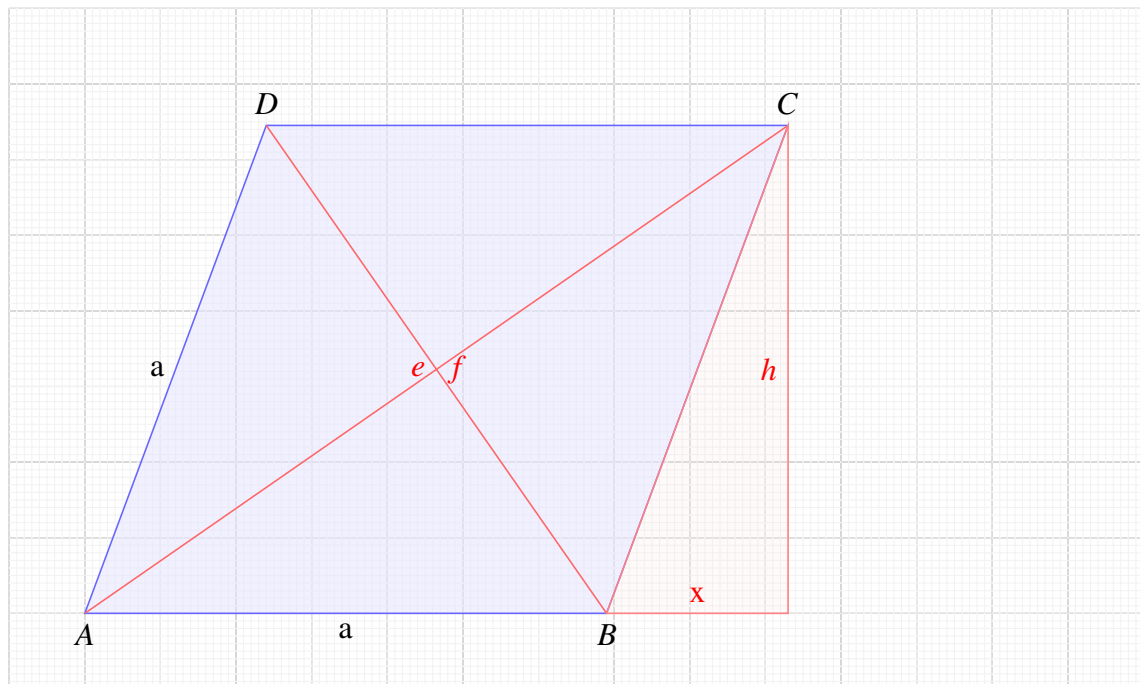
Phytagoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{62.4^2 + (79 + 48.4)^2} = \underline{141.9 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 4929.6}{141.9} = \underline{69.5 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 79 = \underline{316 \text{ mm}}$$

25 $a = 69 \text{ mm}, A = 4451.6 \text{ mm}^2$.



$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{4451.6}{69} = \underline{64.5 \text{ mm}}$$

Phytagoras

$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{69^2 - 64.5^2} = 24.5 \text{ mm}$$

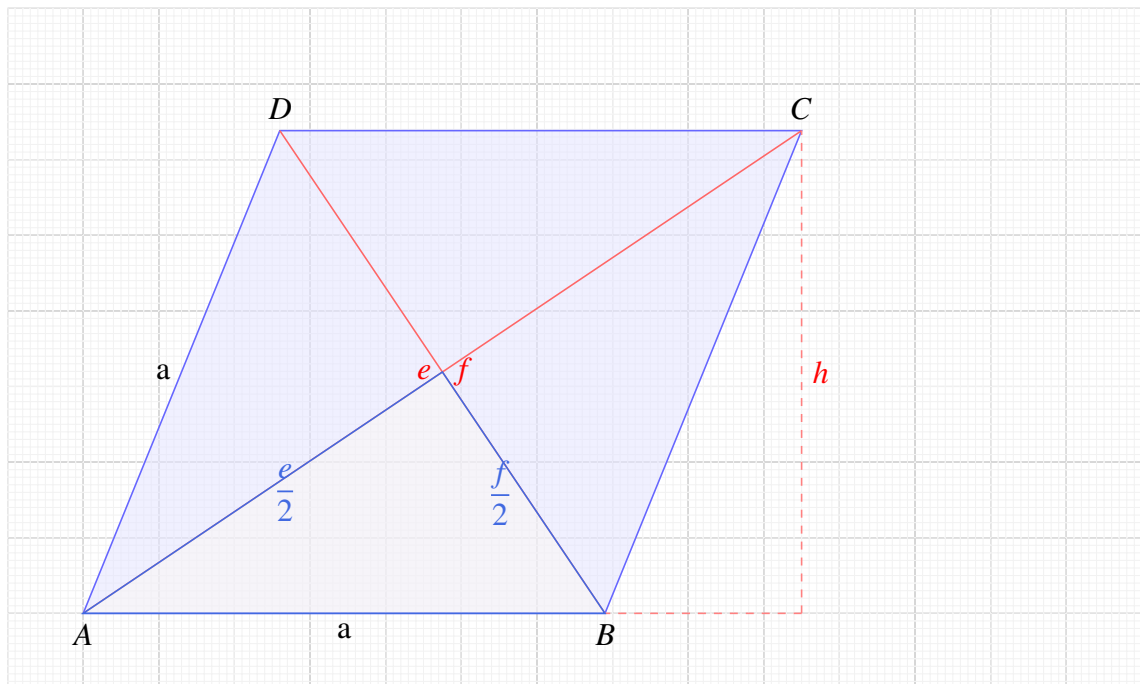
Phytagoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{64.5^2 + (69 + 24.5)^2} = \underline{113.6 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 4451.6}{113.6} = \underline{78.4 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 69 = \underline{276 \text{ mm}}$$

26 $e = 114.6 \text{ mm}$, $A = 4404.6 \text{ mm}^2$.



$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 4404.6}{114.6} = \underline{76.9 \text{ mm}}$$

Phytagoras

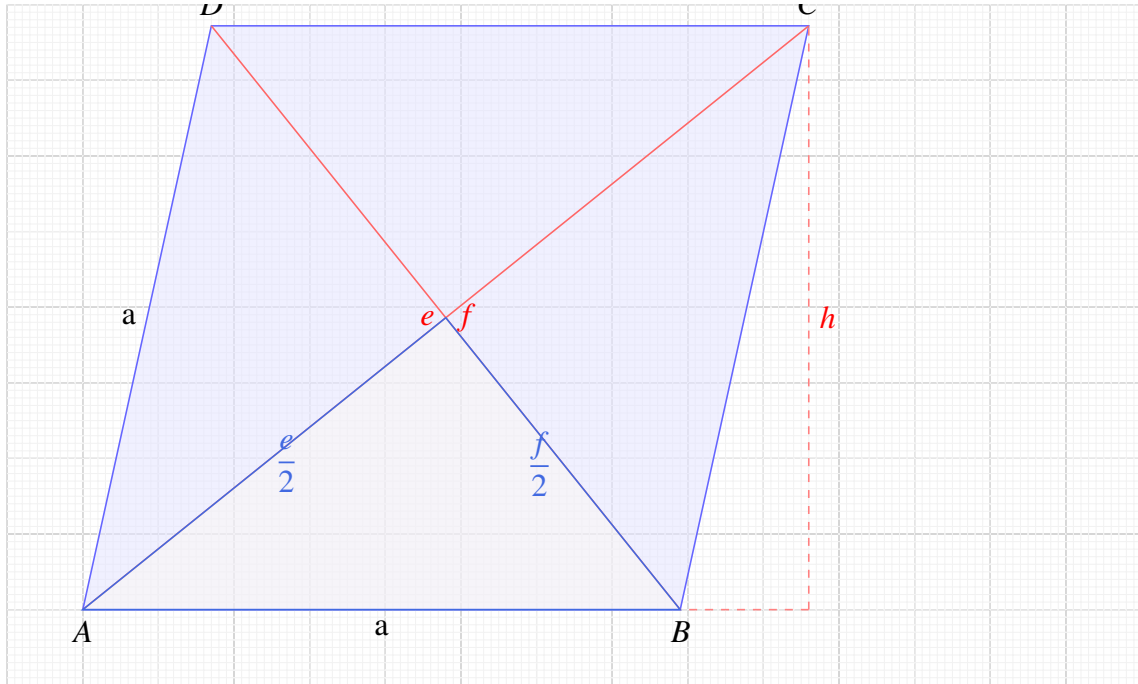
$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{114.6}{2}\right)^2 + \left(\frac{76.9}{2}\right)^2} = \underline{69 \text{ mm}}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{4404.6}{69} = \underline{63.8 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 69 = \underline{276 \text{ mm}}$$

27 $e = 123.0 \text{ mm}, h = 77.2 \text{ mm}.$



$$A = \frac{e \cdot f}{2} \quad \wedge \quad A = a \cdot h$$

$$a \cdot h = \frac{e \cdot f}{2} \quad \Rightarrow \quad a = \frac{e \cdot f}{h \cdot 2}$$

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

$$\left(\frac{e \cdot f}{h \cdot 2}\right)^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

$$\frac{e^2 \cdot f^2}{h^2 \cdot 4} = \frac{e^2 + f^2}{4}$$

$$e^2 \cdot f^2 = e^2 \cdot h^2 + f^2 \cdot h^2$$

$$e^2 \cdot f^2 - f^2 \cdot h^2 = e^2 \cdot h^2$$

$$f^2 \cdot (e^2 - h^2) = e^2 \cdot h^2 \quad \Rightarrow \quad f^2 = \frac{e^2 \cdot h^2}{e^2 - h^2}$$

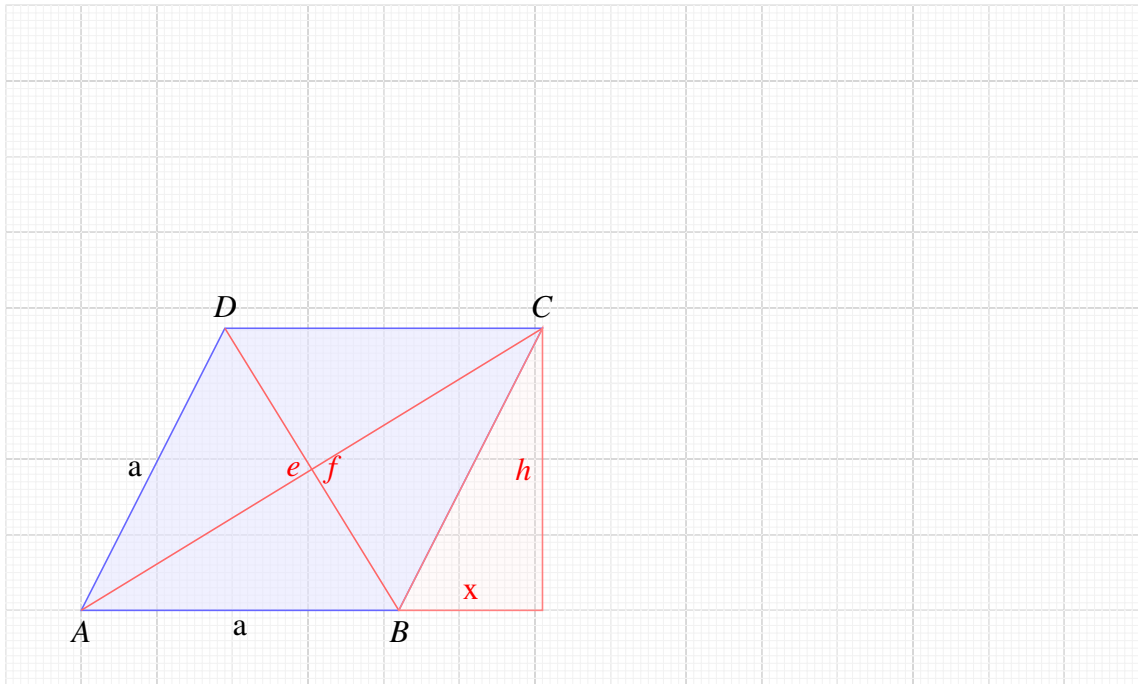
$$f = \sqrt{\frac{e^2 \cdot h^2}{e^2 - h^2}} = \frac{e \cdot h}{\sqrt{e^2 - h^2}} = \frac{123.0^2 \cdot 77.2^2}{\sqrt{123.0^2 - 77.2^2}} = \underline{99.2}$$

$$A = \frac{e \cdot f}{2} = \frac{123.0 \cdot 99.2}{2} = \underline{6098.6 \text{ mm}^2}$$

$$A = a \cdot h \quad \Rightarrow \quad a = \frac{A}{h} = \frac{6098.6}{77.2} = \underline{79 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 79 = \underline{316 \text{ mm}}$$

28 $A = 1566.4 \text{ mm}^2$, $U = 168 \text{ mm}$.



$$U = 4 \cdot a \Rightarrow a = \frac{U}{4} = \frac{168}{4} = \underline{42 \text{ mm}}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{1566.4}{42} = \underline{37.3 \text{ mm}}$$

Phytgoras

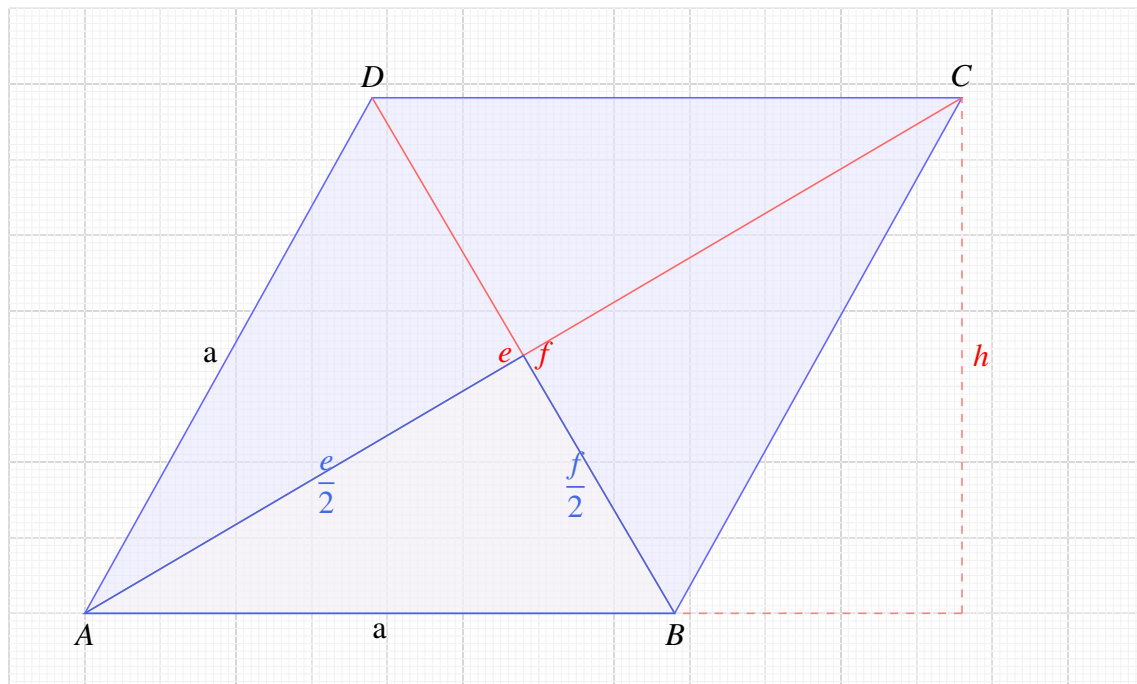
$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{42^2 - 37.3^2} = 19.3 \text{ mm}$$

Phytgoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{37.3^2 + (42 + 19.3)^2} = \underline{71.8 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 1566.4}{71.8} = \underline{43.7 \text{ mm}}$$

29 $e = 134.5 \text{ mm}, f = 79.1 \text{ mm}.$



Phytagoras

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

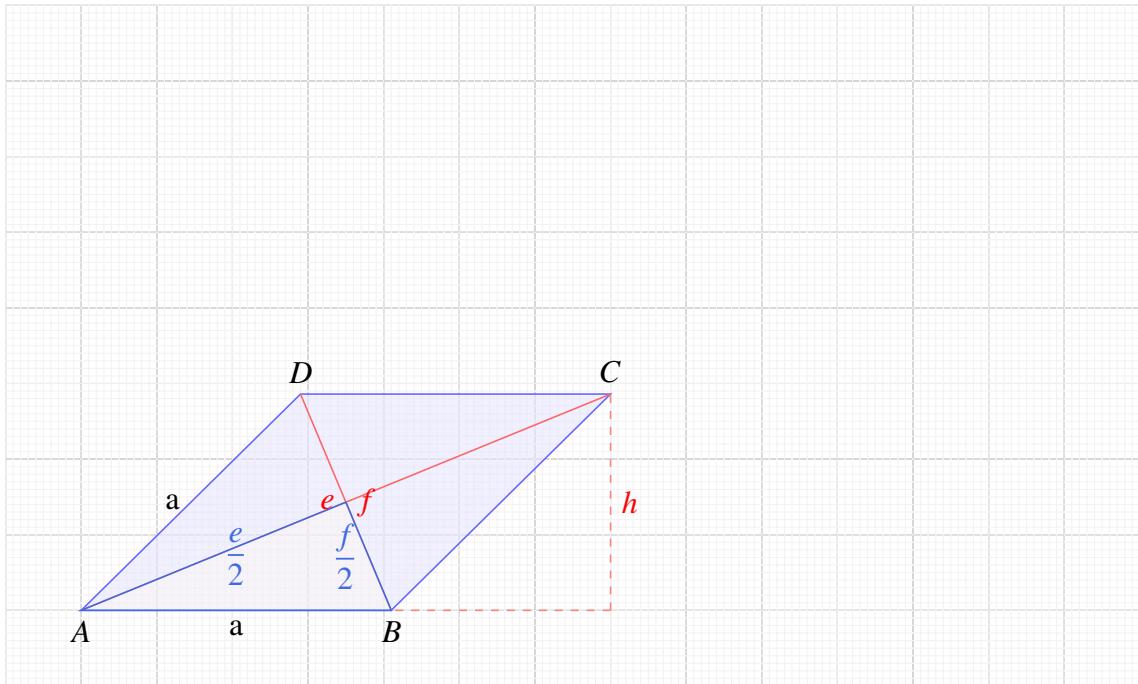
$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{134.5}{2}\right)^2 + \left(\frac{79.1}{2}\right)^2} = \underline{78 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{134.5 \cdot 79.1}{2} = \underline{5318.4 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{5318.4}{78} = \underline{68.2 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 78 = \underline{312 \text{ mm}}$$

30 $a = 41 \text{ mm}$, $e = 76.0 \text{ mm}$.



Phytagoras

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2 \Rightarrow \left(\frac{f}{2}\right)^2 = a^2 - \left(\frac{e}{2}\right)^2$$

$$f = 2 \cdot \sqrt{a^2 - \left(\frac{e}{2}\right)^2} = 2 \cdot \sqrt{41^2 - \left(\frac{76.0}{2}\right)^2} = \underline{30.9 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{76.0 \cdot 30.9}{2} = \underline{1172.6 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{1172.6}{41} = \underline{28.6 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 41 = \underline{164 \text{ mm}}$$

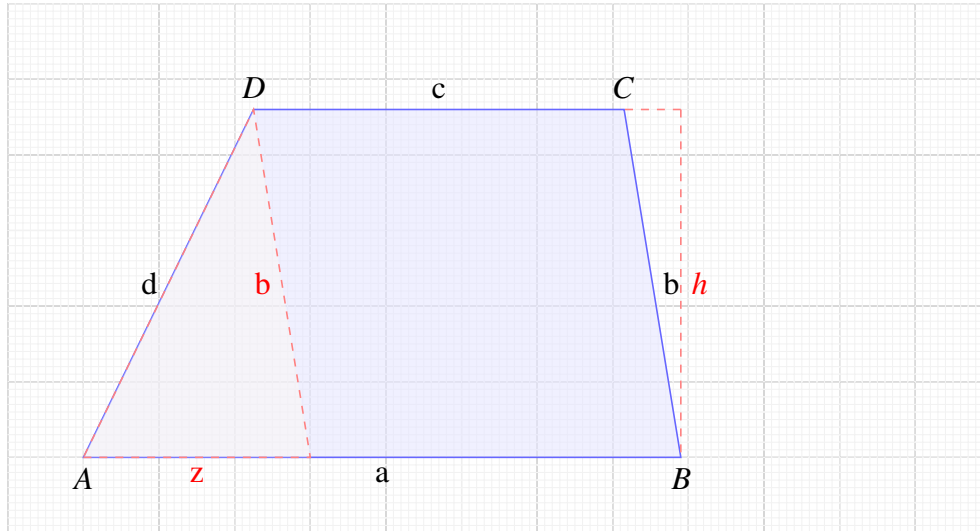
2.1.4 Allgemeines Trapez

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$$31 \quad a = 79 \text{ mm}, b = 46.6 \text{ mm}, c = 49 \text{ mm}, d = 51.2 \text{ mm}.$$



Heronische Flächenformel

$$z = a - c = 79 - 49 = 30 \text{ mm}$$

$$s = \frac{b + d + z}{2} = \frac{46.6 + 51.2 + 30}{2} = 101.5$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - d) \cdot (s - z)} = \sqrt{101.5 \cdot 22.5 \cdot 50.3 \cdot 28.7} = 1817.1 \text{ mm}^2$$

$$A_{\Delta} = \frac{z \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{z} = \frac{2 \cdot 1817.1}{30} = \underline{46.0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{79 + 49}{2} \cdot 46.0 = \underline{2944.2 \text{ mm}^2}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{51.2^2 - 46.0^2} = 22.5 \text{ mm}$$

Phytgoras

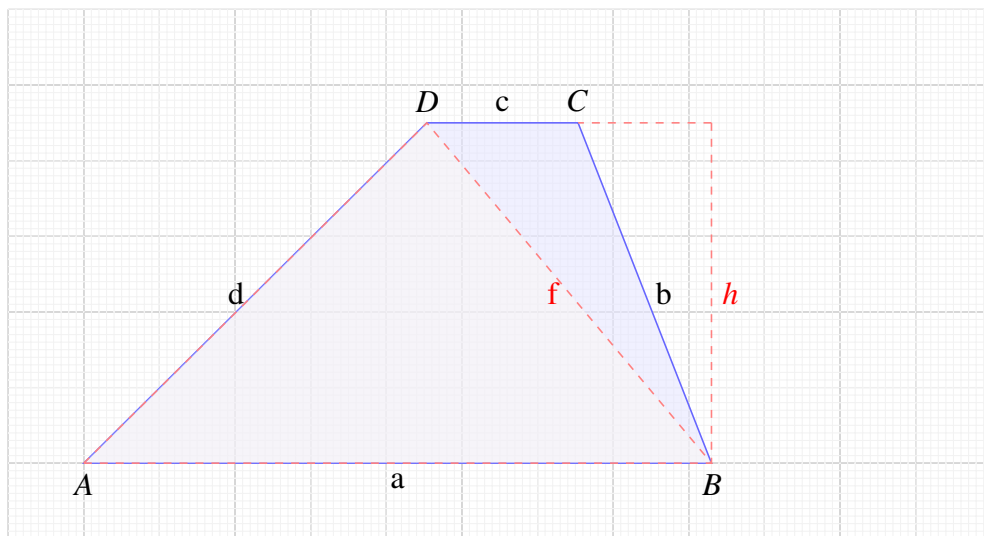
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{46.0^2 + (49 + 22.5)^2} = \underline{85.0 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 79 - 22.5 - 49 = 7.5 \text{ mm}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{46.0^2 + (49 + 7.5)^2} = \underline{72.9 \text{ mm}}$$

32 $a = 83 \text{ mm}, b = 48.3 \text{ mm}, d = 63.9 \text{ mm}, f = 58.7 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{83 + 63.9 + 58.7}{2} = 102.8 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{102.8 \cdot 19.8 \cdot 38.9 \cdot 44.1} = 1867.2 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1867.2}{83} = \underline{45.0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{63.9^2 - 45.0^2} = 45.4 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{48.3^2 - 45.0^2} = 17.6 \text{ mm}$$

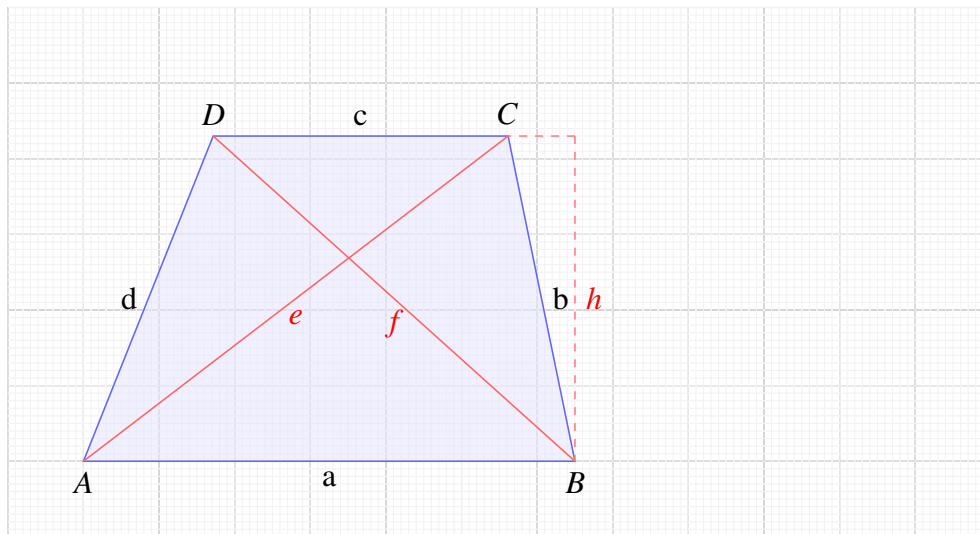
Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{45.0^2 + (20 + 45.4)^2} = \underline{79.3 \text{ mm}}$$

$$c = a - x - y = 83 - 45.4 - 17.6 = \underline{20 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{83 + 20}{2} \cdot 45.0 = \underline{2317.2 \text{ mm}^2}$$

33 $a = 65 \text{ mm}, c = 39 \text{ mm}, d = 46.3 \text{ mm}, f = 64.3 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{65 + 46.3 + 64.3}{2} = 78.0 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{78.0 \cdot 39.0 \cdot 31.7 \cdot 7.3} = 838.6 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 838.6}{65} = \underline{43.0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{46.3^2 - 43.0^2} = 17.2 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 65 - 17.2 - 39 = 8.8 \text{ mm}$$

Phytagoras

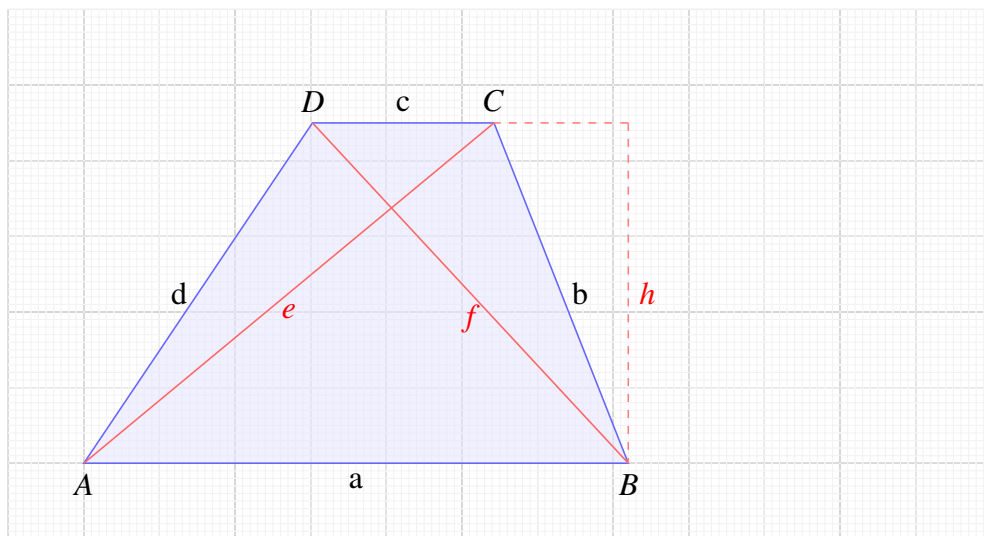
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{43.0^2 + 8.8^2} = \underline{43.9 \text{ mm}}$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{43.0^2 + (39 + 17.2)^2} = \underline{70.7 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{65 + 39}{2} \cdot 43.0 = \underline{2236.1 \text{ mm}^2}$$

34 $a = 72 \text{ mm}, c = 24 \text{ mm}, d = 54.2 \text{ mm}, e = 70.5 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{c + d + e}{2} = \frac{24 + 54.2 + 70.5}{2} = 93.8 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - c) \cdot (s - d) \cdot (s - e)} = \sqrt{93.8 \cdot 21.8 \cdot 39.6 \cdot 32.4} = 1620.1 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 1620.1}{24} = \underline{45.0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{54.2^2 - 45.0^2} = 30.2 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 72 - 30.2 - 24 = 17.8 \text{ mm}$$

Phytagoras

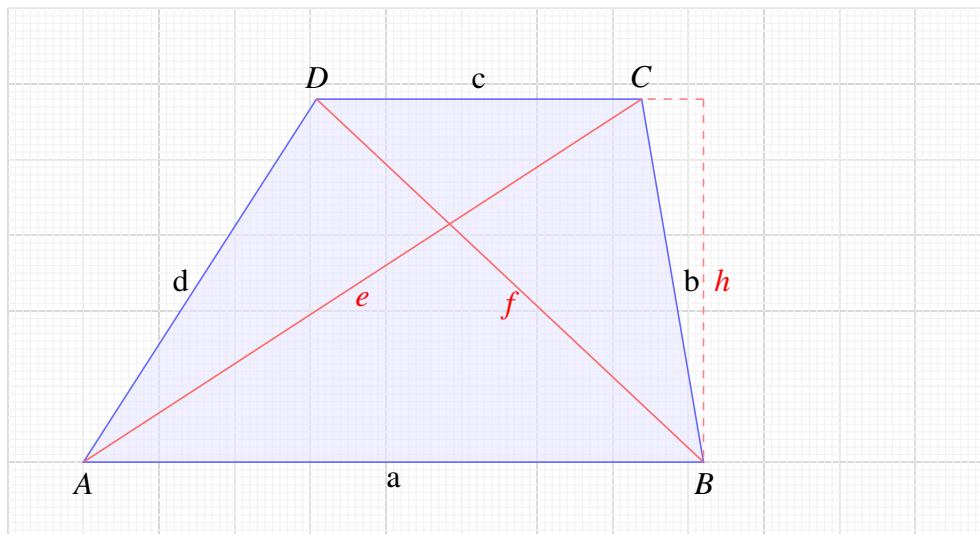
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{45.0^2 + 17.8^2} = \underline{48.4 \text{ mm}}$$

Phytagoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{45.0^2 + (24 + 17.8)^2} = \underline{61.4 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{72 + 24}{2} \cdot 45.0 = \underline{2160.1 \text{ mm}^2}$$

35 $a = 82 \text{ mm}, c = 43 \text{ mm}, f = 70.2 \text{ mm}, A = 2999.9 \text{ mm}^2$.



$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2999.9}{82+43} = \underline{48.0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c+y)^2 \Rightarrow y = \sqrt{f^2 - h^2} - c = \sqrt{70.2^2 - 48.0^2} - 43 = 8.2 \text{ mm}$$

$$c = a - x - y \Rightarrow x = a - y - c = 82 - 8.2 - 43 = 30.8 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{48.0^2 + 8.2^2} = \underline{48.7 \text{ mm}}$$

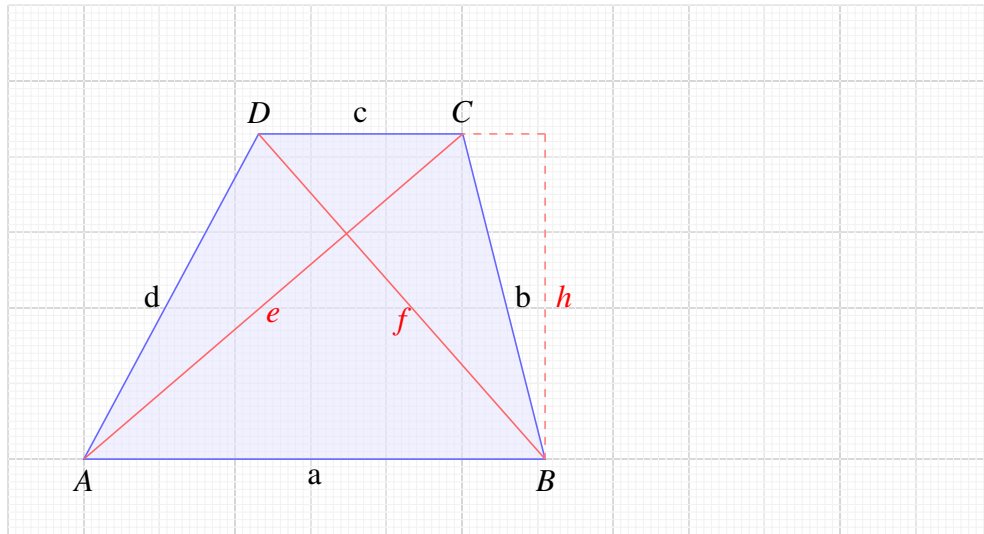
Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow d = \sqrt{h^2 + x^2} = \sqrt{48.0^2 + 30.8^2} = \underline{57.0 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c+x)^2 \Rightarrow e = \sqrt{h^2 + (c+x)^2} = \sqrt{48.0^2 + (43+30.8)^2} = \underline{88.1 \text{ mm}}$$

36 $a = 61 \text{ mm}, c = 27 \text{ mm}, d = 48.8 \text{ mm}, h = 43.0 \text{ mm}.$



Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{48.8^2 - 43.0^2} = 23.1 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 61 - 23.1 - 27 = 10.9 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{43.0^2 + 10.9^2} = \underline{44.4 \text{ mm}}$$

Phytgoras

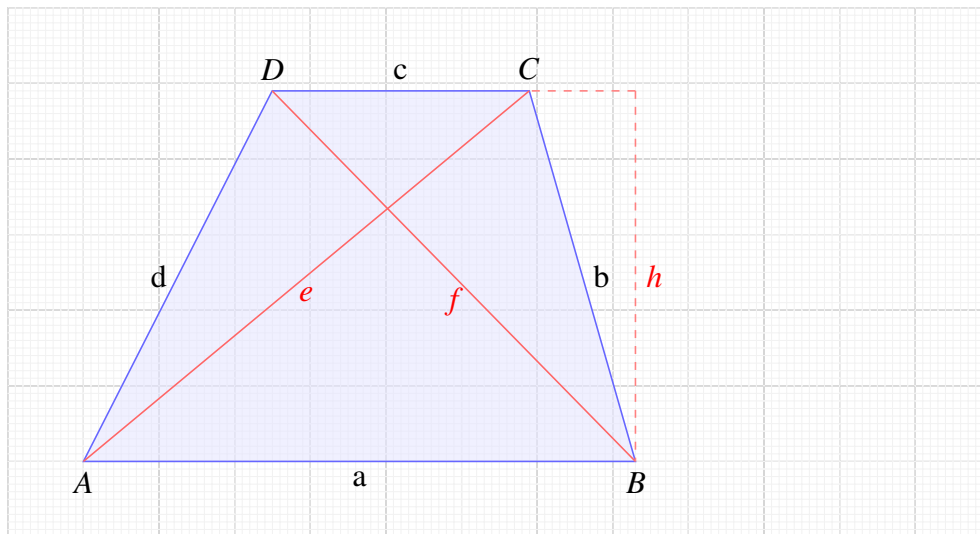
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{43.0^2 + (27 + 23.1)^2} = \underline{66.0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{43.0^2 + (27 + 10.9)^2} = \underline{57.3 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{61 + 27}{2} \cdot 43.0 = \underline{1892.1 \text{ mm}^2}$$

37 $b = 51.0 \text{ mm}, c = 34 \text{ mm}, d = 55.0 \text{ mm}, f = 68.6 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{b + c + f}{2} = \frac{51.0 + 34 + 68.6}{2} = 98.3 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - c) \cdot (s - f)} = \sqrt{98.3 \cdot 25.3 \cdot 43.3 \cdot 29.7} = 1788.5 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 1788.5}{34} = \underline{49.0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{55.0^2 - 49.0^2} = 25.0 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{51.0^2 - 49.0^2} = 14.0 \text{ mm}$$

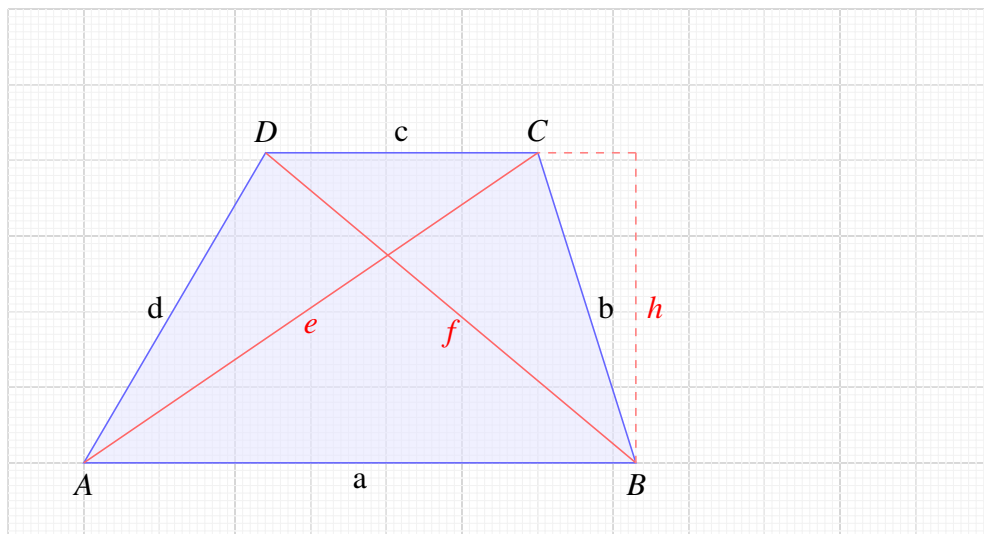
$$a = c + x + y = 34 + 25.0 + 14.0 = \underline{73 \text{ mm}}$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{49.0^2 + (34 + 25.0)^2} = \underline{76.7 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{73 + 34}{2} \cdot 49.0 = \underline{2621.4 \text{ mm}^2}$$

38 $a = 73 \text{ mm}, d = 47.5 \text{ mm}, f = 63.9 \text{ mm}, A = 2234.6 \text{ mm}^2.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{73 + 47.5 + 63.9}{2} = 92.2 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{92.2 \cdot 19.2 \cdot 44.7 \cdot 28.3} = 1496.6 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1496.6}{73} = \underline{41.0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{47.5^2 - 41.0^2} = 24.0 \text{ mm}$$

$$A = \frac{a + c}{2} \cdot h \Rightarrow c = \frac{2 \cdot A}{h} - a = \frac{2 \cdot 2234.6}{41.0} - 73 = \underline{36 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 73 - 24.0 - 36 = 13.0 \text{ mm}$$

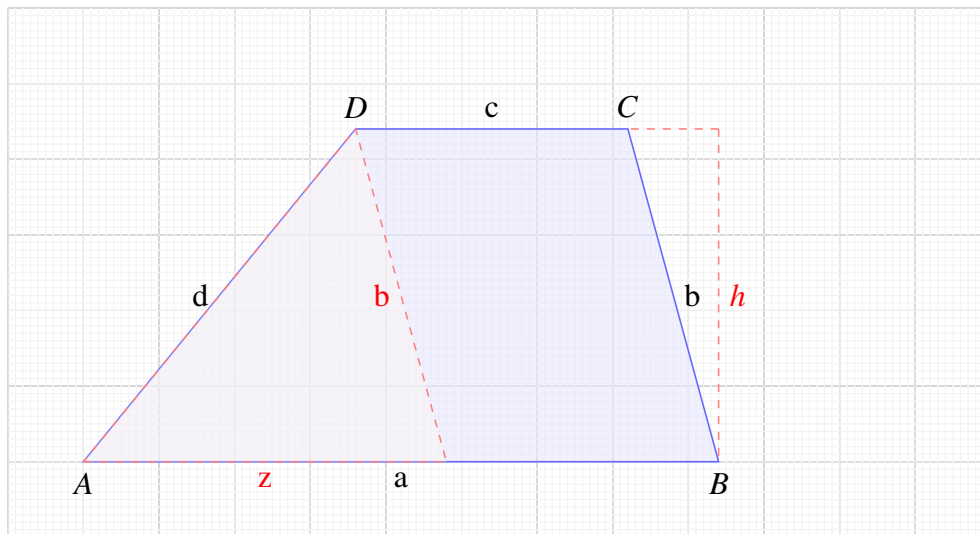
Phytagoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{41.0^2 + 13.0^2} = \underline{43 \text{ mm}}$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{41.0^2 + (36 + 24.0)^2} = \underline{72.7 \text{ mm}}$$

39 $a = 84 \text{ mm}$, $b = 45.6 \text{ mm}$, $c = 36 \text{ mm}$, $d = 56.9 \text{ mm}$.



Heronsche Flächenformel

$$z = a - c = 84 - 36 = 48 \text{ mm}$$

$$s = \frac{b + d + z}{2} = \frac{45.6 + 56.9 + 48}{2} = 103.0$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - d) \cdot (s - z)} = \sqrt{103.0 \cdot 19.0 \cdot 46.1 \cdot 37.9} = 1848.1 \text{ mm}^2$$

$$A_{\Delta} = \frac{z \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{z} = \frac{2 \cdot 1848.1}{48} = \underline{44.0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{84 + 36}{2} \cdot 44.0 = \underline{2640.1 \text{ mm}^2}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{56.9^2 - 44.0^2} = 36.0 \text{ mm}$$

Phytagoras

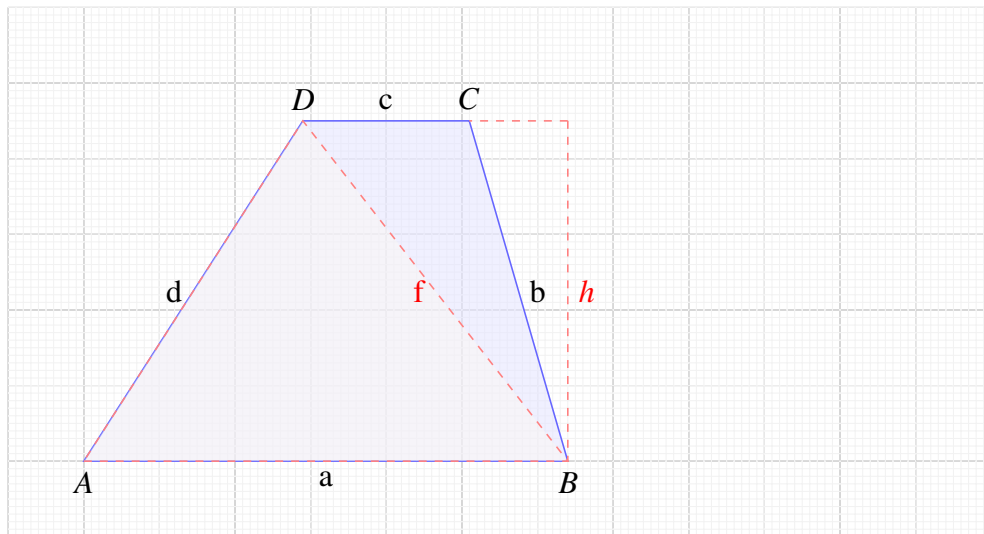
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{44.0^2 + (36 + 36.0)^2} = \underline{84.4 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 84 - 36.0 - 36 = 12.0 \text{ mm}$$

Phytagoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{44.0^2 + (36 + 12.0)^2} = \underline{65.1 \text{ mm}}$$

40 $a = 64 \text{ mm}, b = 46.9 \text{ mm}, d = 53.5 \text{ mm}, f = 57.0 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{64 + 53.5 + 57.0}{2} = 87.3 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{87.3 \cdot 23.3 \cdot 33.8 \cdot 30.2} = 1440.1 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1440.1}{64} = \underline{45.0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{53.5^2 - 45.0^2} = 29.0 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{46.9^2 - 45.0^2} = 13.0 \text{ mm}$$

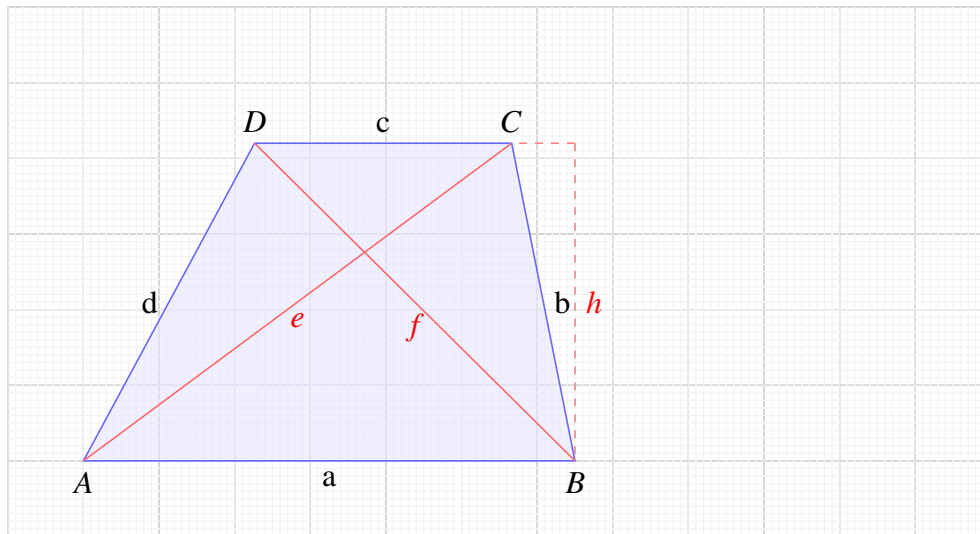
Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{45.0^2 + (22 + 29.0)^2} = \underline{68.0 \text{ mm}}$$

$$c = a - x - y = 64 - 29.0 - 13.0 = \underline{22 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{64 + 22}{2} \cdot 45.0 = \underline{1935.1 \text{ mm}^2}$$

41 $a = 65 \text{ mm}, c = 34 \text{ mm}, d = 47.7 \text{ mm}, f = 59.7 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{65 + 47.7 + 59.7}{2} = 76.1 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{76.1 \cdot 42.1 \cdot 28.4 \cdot 5.6} = 714.1 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 714.1}{65} = \underline{42.0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{47.7^2 - 42.0^2} = 22.6 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 65 - 22.6 - 34 = 8.4 \text{ mm}$$

Phytgoras

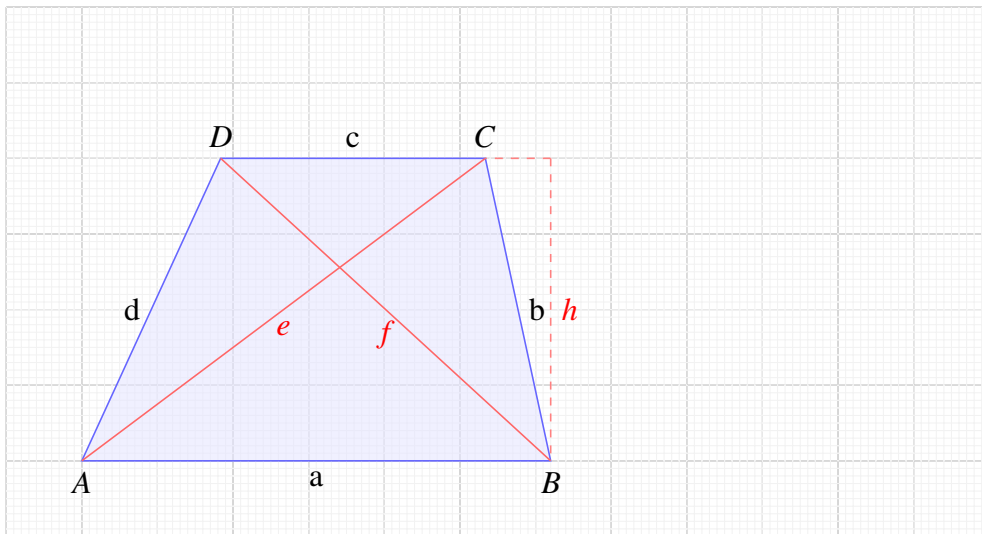
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{42.0^2 + 8.4^2} = \underline{42.8 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{42.0^2 + (34 + 22.6)^2} = \underline{70.5 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{65 + 34}{2} \cdot 42.0 = \underline{2079.2 \text{ mm}^2}$$

42 $a = 62 \text{ mm}$, $c = 35 \text{ mm}$, $d = 44.0 \text{ mm}$, $e = 66.7 \text{ mm}$.



Heronsche Flächenformel

$$s = \frac{c + d + e}{2} = \frac{35 + 44.0 + 66.7}{2} = 82.6 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - c) \cdot (s - d) \cdot (s - e)} = \sqrt{82.6 \cdot 20.6 \cdot 38.6 \cdot 23.4} = 1240.0 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 1240.0}{35} = \underline{40.0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{44.0^2 - 40.0^2} = 18.4 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 62 - 18.4 - 35 = 8.6 \text{ mm}$$

Phytgoras

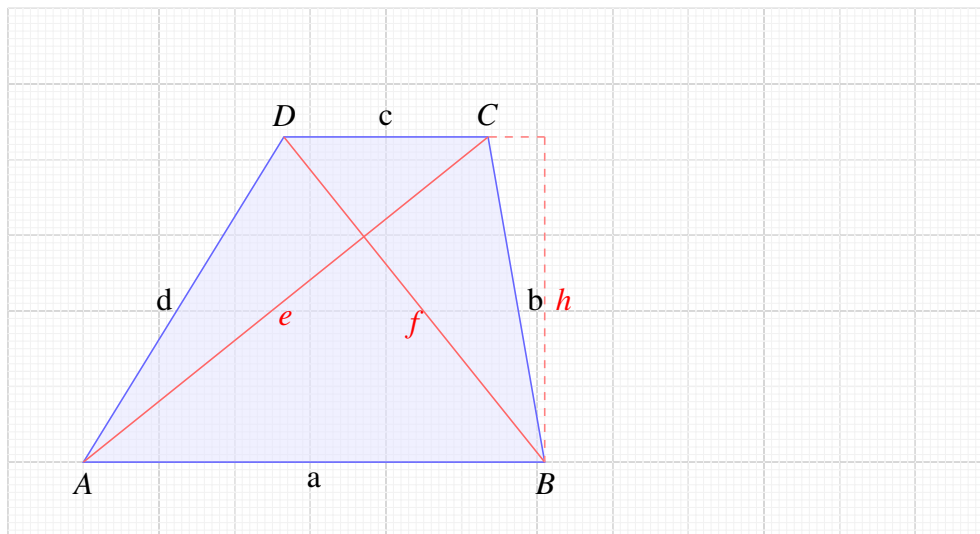
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{40.0^2 + 8.6^2} = \underline{40.9 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{40.0^2 + (35 + 8.6)^2} = \underline{59.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{62 + 35}{2} \cdot 40.0 = \underline{1939.9 \text{ mm}^2}$$

43 $a = 61 \text{ mm}, c = 27 \text{ mm}, f = 55.1 \text{ mm}, A = 1892.1 \text{ mm}^2$.



$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 1892.1}{61+27} = \underline{43.0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c+y)^2 \Rightarrow y = \sqrt{f^2 - h^2} - c = \sqrt{55.1^2 - 43.0^2} - 27 = 7.5 \text{ mm}$$

$$c = a - x - y \Rightarrow x = a - y - c = 61 - 7.5 - 27 = 26.5 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{43.0^2 + 7.5^2} = \underline{43.6 \text{ mm}}$$

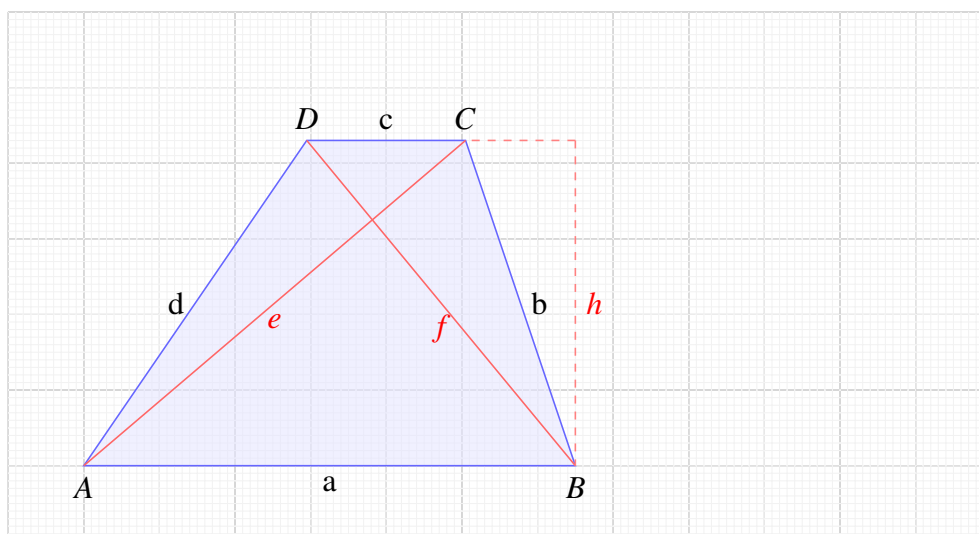
Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow d = \sqrt{h^2 + x^2} = \sqrt{43.0^2 + 26.5^2} = \underline{50.5 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c+x)^2 \Rightarrow e = \sqrt{h^2 + (c+x)^2} = \sqrt{43.0^2 + (27+26.5)^2} = \underline{68.7 \text{ mm}}$$

44 $a = 65 \text{ mm}, c = 21 \text{ mm}, d = 52.1 \text{ mm}, h = 43.0 \text{ mm}.$



Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{52.1^2 - 43.0^2} = 29.5 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 65 - 29.5 - 21 = 14.5 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{43.0^2 + 14.5^2} = \underline{45.4 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{43.0^2 + (21 + 29.5)^2} = \underline{66.3 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{43.0^2 + (21 + 14.5)^2} = \underline{55.8 \text{ mm}}$$

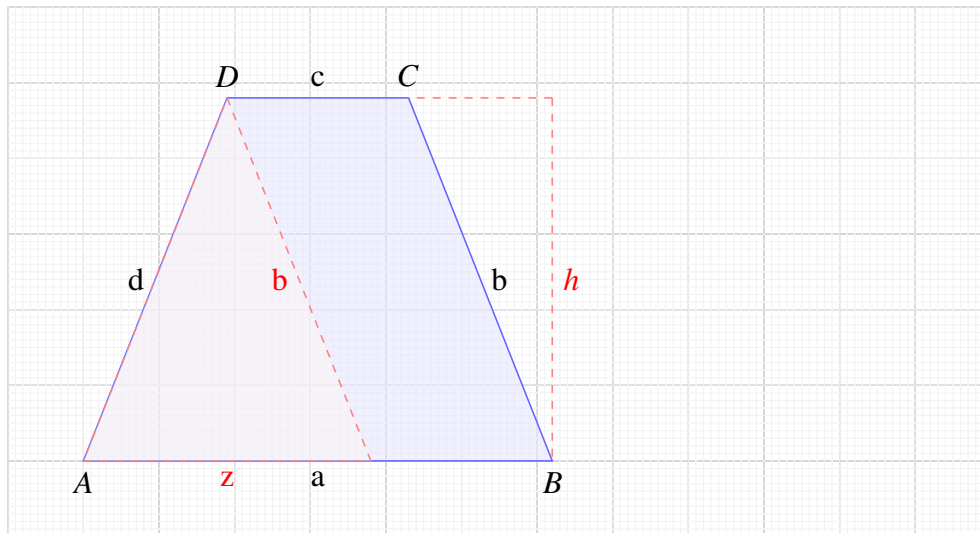
$$A = \frac{a + c}{2} \cdot h = \frac{65 + 21}{2} \cdot 43.0 = \underline{1849.2 \text{ mm}^2}$$

2.1.5 Gleichschenkeliges Trapez

Text undefined 1 ...

11:13 **5**

17th January 2014

45 $a = 62 \text{ mm}, b = 51.6 \text{ mm}, h = 48.0 \text{ mm}.$ 

$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{51.6^2 - 48.0^2} = 19.0 \text{ mm}$$

$$c = a - 2 \cdot x = 62 - 2 \cdot 19.0 = \underline{24 \text{ mm}}$$

Phytagoras

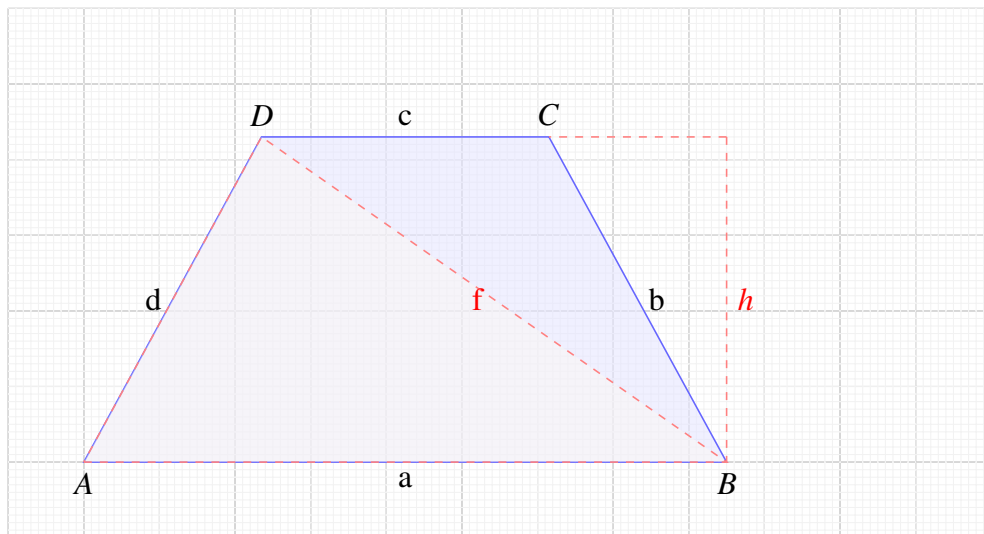
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{48.0^2 + (24 + 19.0)^2} = \underline{64.4 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{62 + 24}{2} \cdot 48.0 = \underline{2063.8 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 62 + 24 + 2 \cdot 51.6 = \underline{189.2 \text{ mm}}$$

46 $a = 85 \text{ mm}, b = 49 \text{ mm}, c = 38 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{85 - 38}{2} = 23.5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{49^2 - 23.5^2} = \underline{43.0 \text{ mm}}$$

Phytagoras

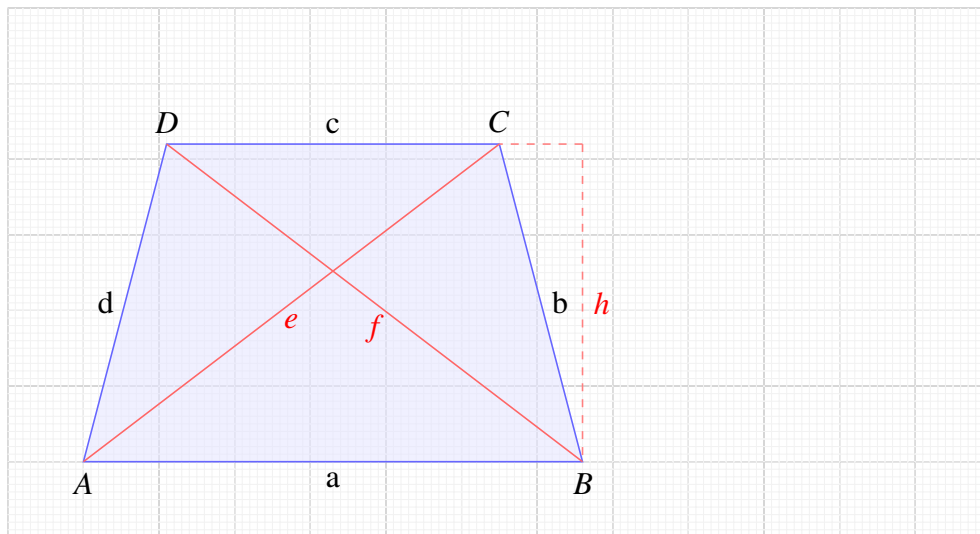
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{43.0^2 + (38 + 23.5)^2} = \underline{75.0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{85 + 38}{2} \cdot 43.0 = \underline{2644.3 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 85 + 38 + 2 \cdot 49 = \underline{221 \text{ mm}}$$

47 $a = 66 \text{ mm}$, $b = 43.4 \text{ mm}$, $U = 196.8 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

$$U = a + c + 2 \cdot b \Rightarrow c = U - a - 2 \cdot b = 196.8 - 66 - 2 \cdot 43.4 = \underline{44 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{66 - 44}{2} = 11 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{43.4^2 - 11^2} = \underline{42.0 \text{ mm}}$$

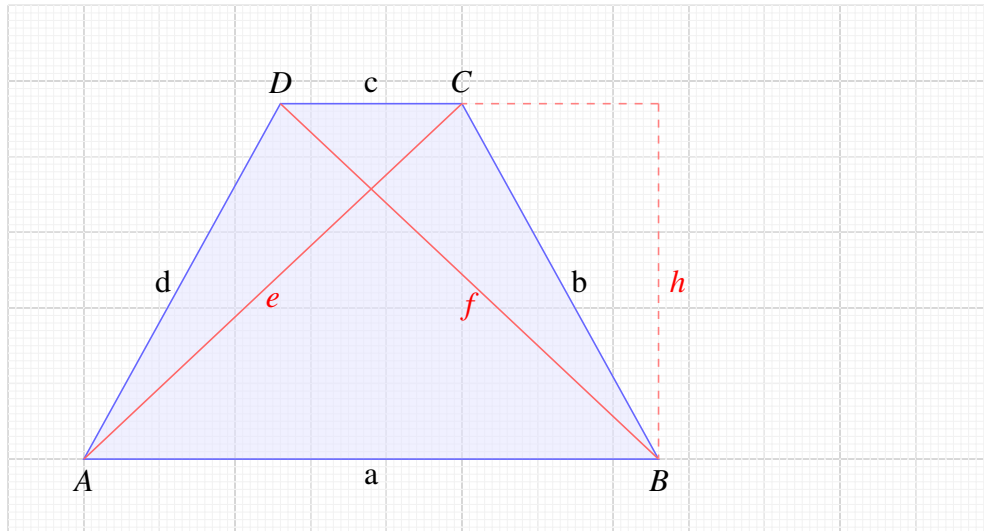
Phytagoras

$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{42.0^2 + (44 + 11)^2} = \underline{69.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{66 + 44}{2} \cdot 42.0 = \underline{2310.2 \text{ mm}^2}$$

48 $a = 76 \text{ mm}, c = 24 \text{ mm}, A = 2349.9 \text{ mm}^2.$



$$b = d$$

$$x = y$$

$$e = f$$

$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2349.9}{76+24} = \underline{47.0 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a-c}{2} = \frac{76-24}{2} = 26.0 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{47.0^2 + 26.0^2} = \underline{53.7 \text{ mm}}$$

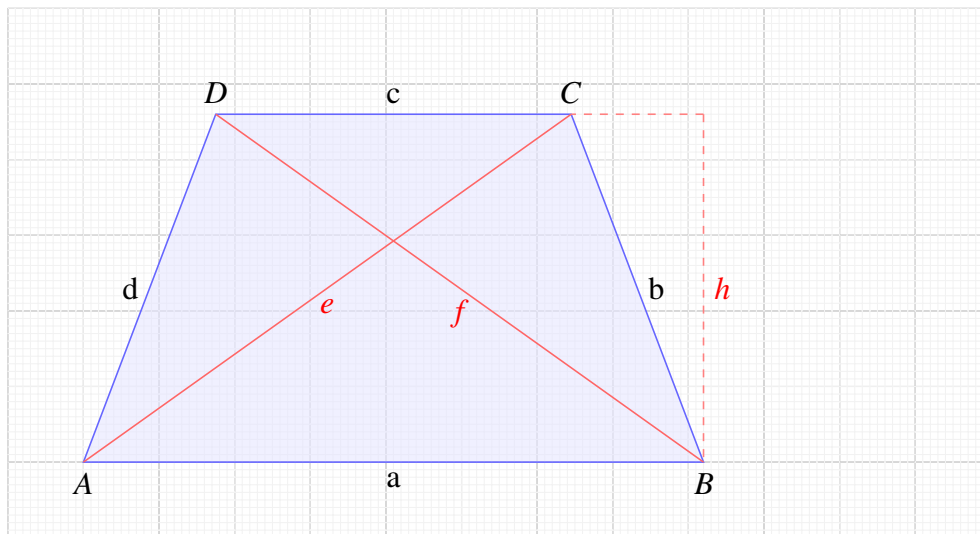
Phytagoras

$$e^2 = h^2 + (c+x)^2$$

$$e = \sqrt{h^2 + (c+x)^2} = \sqrt{47.0^2 + (24+26.0)^2} = \underline{68.6 \text{ mm}}$$

$$U = a + c + 2 \cdot b = 76 + 24 + 2 \cdot 53.7 = \underline{207.4 \text{ mm}}$$

49 $b = 49.2 \text{ mm}$, $c = 47 \text{ mm}$, $h = 46.0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{49.2^2 - 46.0^2} = 17.5 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 47 + 2 \cdot 17.5 = \underline{82 \text{ mm}}$$

Phytagoras

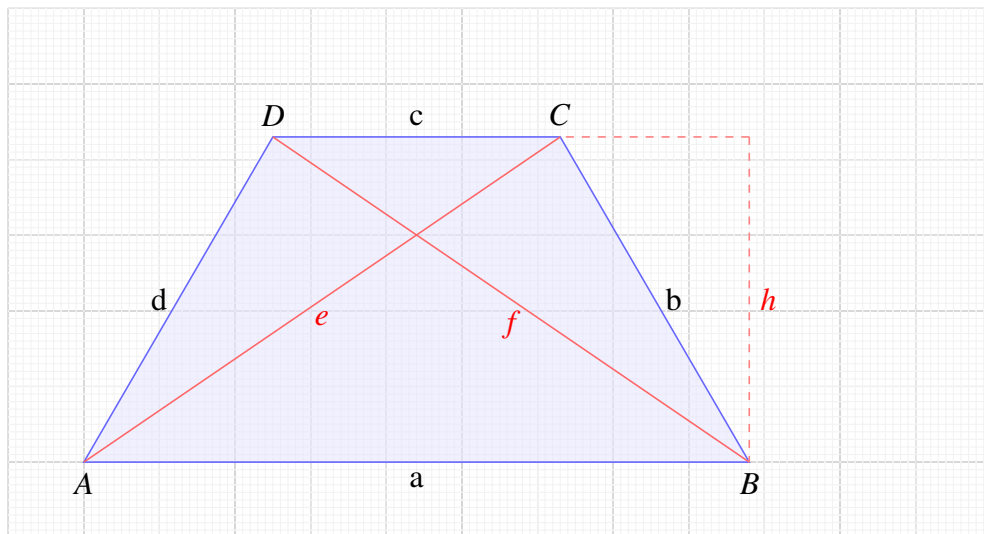
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{46.0^2 + (47 + 17.5)^2} = \underline{79.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{82 + 47}{2} \cdot 46.0 = \underline{2967.3 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 82 + 47 + 2 \cdot 49.2 = \underline{227.4 \text{ mm}}$$

50 $c = 38 \text{ mm}, e = 76.3 \text{ mm}, h = 43.0 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow x = \sqrt{e^2 - h^2} - c = \sqrt{76.3^2 - 43.0^2} - 38 = 25.0 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 38 + 2 \cdot 25.0 = \underline{88 \text{ mm}}$$

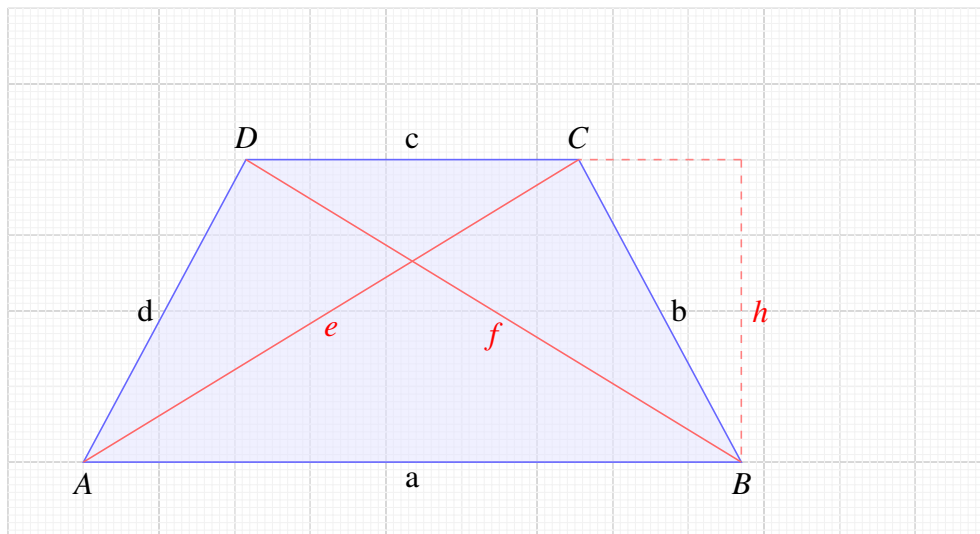
Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{43.0^2 + 25.0^2} = \underline{49.7 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{88 + 38}{2} \cdot 43.0 = \underline{2709.0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 88 + 38 + 2 \cdot 49.7 = \underline{225.5 \text{ mm}}$$

51 $a = 87 \text{ mm}$, $e = 76.7 \text{ mm}$, $h = 40.0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + y^2 \Rightarrow y = \sqrt{e^2 - h^2} = \sqrt{76.7^2 - 40.0^2} = 65.5 \text{ mm}$$

$$x = a - y = 87 - 65.5 = 21.5 \text{ mm}$$

Phytagoras

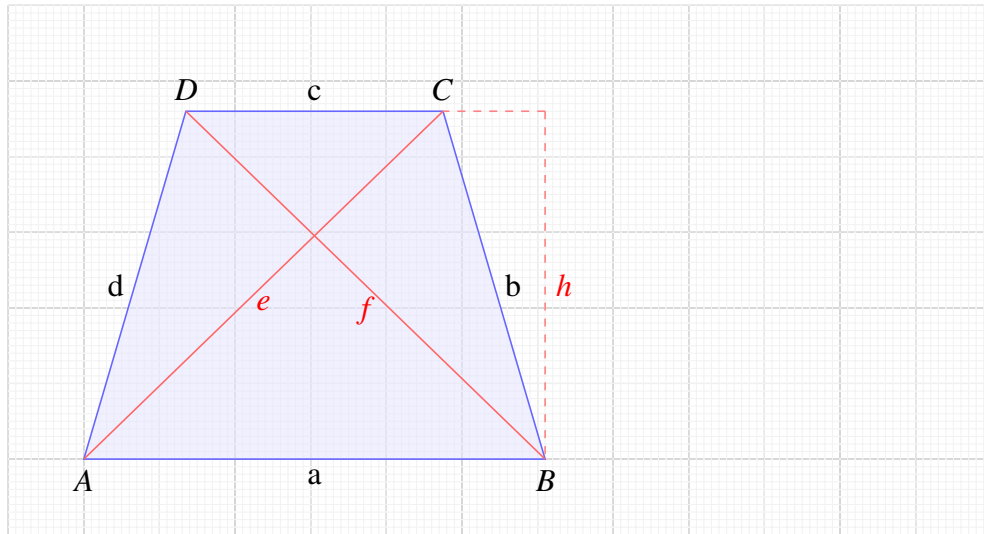
$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{40.0^2 + 21.5^2} = \underline{45.4 \text{ mm}}$$

$$c = a - 2 \cdot x = 87 - 2 \cdot 21.5 = \underline{44 \text{ mm}}$$

$$A = \frac{a+c}{2} \cdot h = \frac{87+44}{2} \cdot 40.0 = \underline{2619.9 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 87 + 44 + 2 \cdot 45.4 = \underline{221.8 \text{ mm}}$$

52 $a = 61 \text{ mm}, b = 47.9 \text{ mm}, e = 66.1 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + (a - x)^2 \Rightarrow h^2 = e^2 - (a - x)^2$$

$$b^2 = h^2 + x^2 \Rightarrow h^2 = b^2 - x^2$$

$$b^2 - x^2 = e^2 - (a - x)^2$$

$$b^2 - x^2 = e^2 - (a^2 - 2ax + x^2)$$

$$b^2 = e^2 - a^2 + 2ax$$

$$2ax = a^2 + b^2 - e^2$$

$$x = \frac{a^2 + b^2 - e^2}{2a} = \frac{61^2 + 47.9^2 - 66.1^2}{261} = 13.5$$

$$c = a - 2 \cdot x = 61 - 2 \cdot 13.5 = \underline{34 \text{ mm}}$$

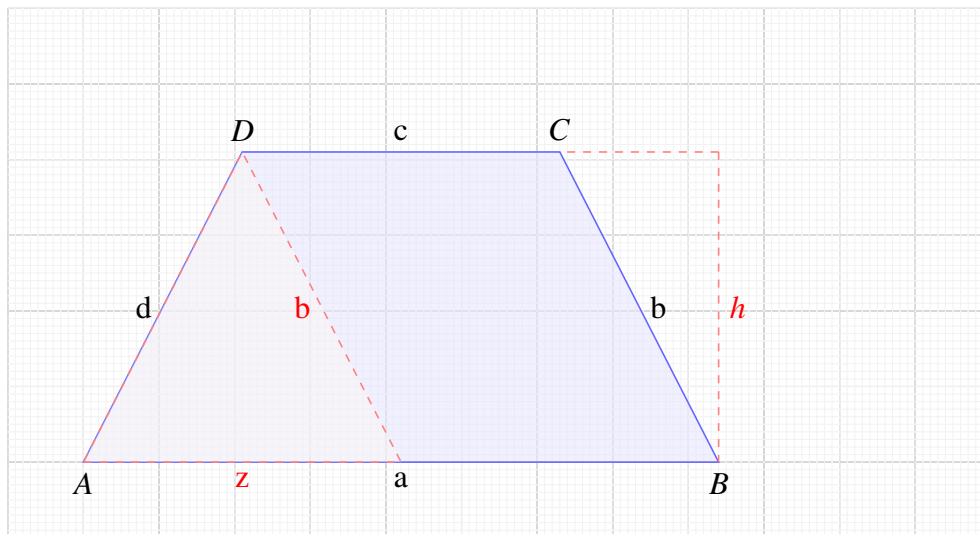
Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{47.9^2 - 13.5^2} = \underline{46.0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{61 + 34}{2} \cdot 46.0 = \underline{2185.0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 61 + 34 + 2 \cdot 47.9 = \underline{190.9 \text{ mm}}$$

53 $a = 84 \text{ mm}$, $b = 46.1 \text{ mm}$, $h = 41.0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{46.1^2 - 41.0^2} = 21.0 \text{ mm}$$

$$c = a - 2 \cdot x = 84 - 2 \cdot 21.0 = \underline{42 \text{ mm}}$$

Phytagoras

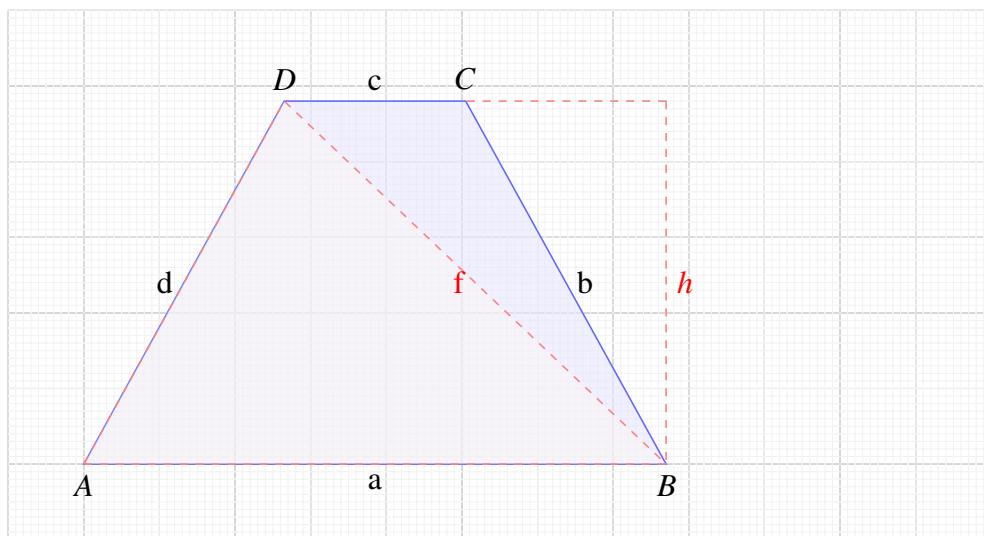
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{41.0^2 + (42 + 21.0)^2} = \underline{75.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{84 + 42}{2} \cdot 41.0 = \underline{2583.3 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 84 + 42 + 2 \cdot 46.1 = \underline{218.1 \text{ mm}}$$

54 $a = 77 \text{ mm}, b = 54.8 \text{ mm}, c = 24 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{77 - 24}{2} = 26.5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{54.8^2 - 26.5^2} = \underline{48.0 \text{ mm}}$$

Phytagoras

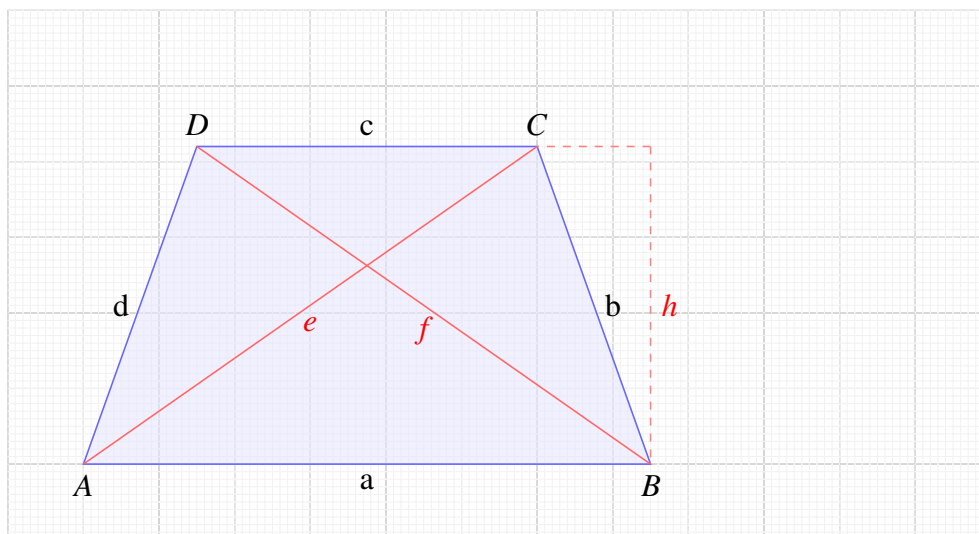
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{48.0^2 + (24 + 26.5)^2} = \underline{69.7 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{77 + 24}{2} \cdot 48.0 = \underline{2424.0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 77 + 24 + 2 \cdot 54.8 = \underline{210.7 \text{ mm}}$$

55 $a = 75 \text{ mm}, b = 44.6 \text{ mm}, U = 209.2 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

$$U = a + c + 2 \cdot b \Rightarrow c = U - a - 2 \cdot b = 209.2 - 75 - 2 \cdot 44.6 = \underline{45 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{75 - 45}{2} = 15.0 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{44.6^2 - 15.0^2} = \underline{42.0 \text{ mm}}$$

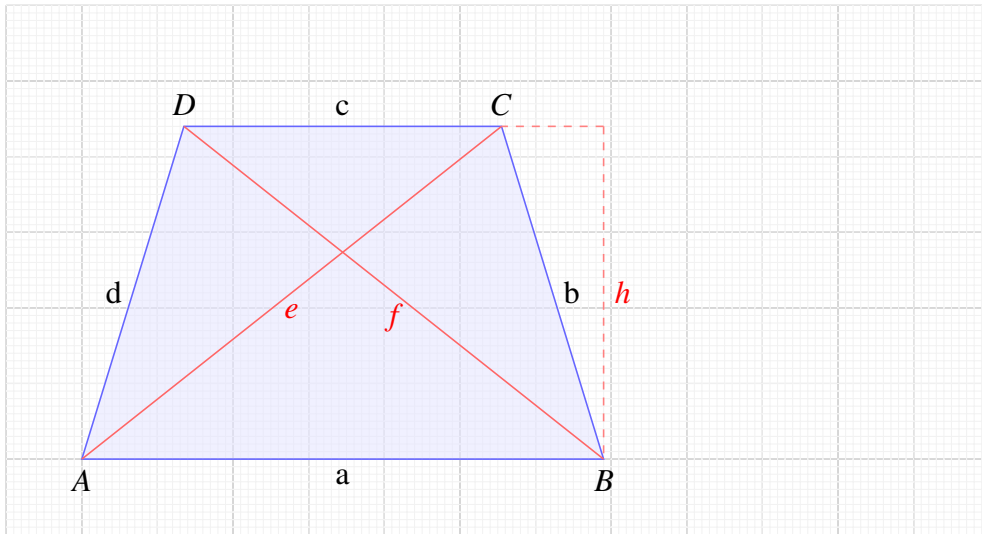
Phytagoras

$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{42.0^2 + (45 + 15.0)^2} = \underline{73.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{75 + 45}{2} \cdot 42.0 = \underline{2520.1 \text{ mm}^2}$$

56 $a = 69 \text{ mm}, c = 42 \text{ mm}, A = 2441.7 \text{ mm}^2$.



$$b = d$$

$$x = y$$

$$e = f$$

$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2441.7}{69+42} = \underline{44.0 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a-c}{2} = \frac{69-42}{2} = 13.5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{44.0^2 + 13.5^2} = \underline{46.0 \text{ mm}}$$

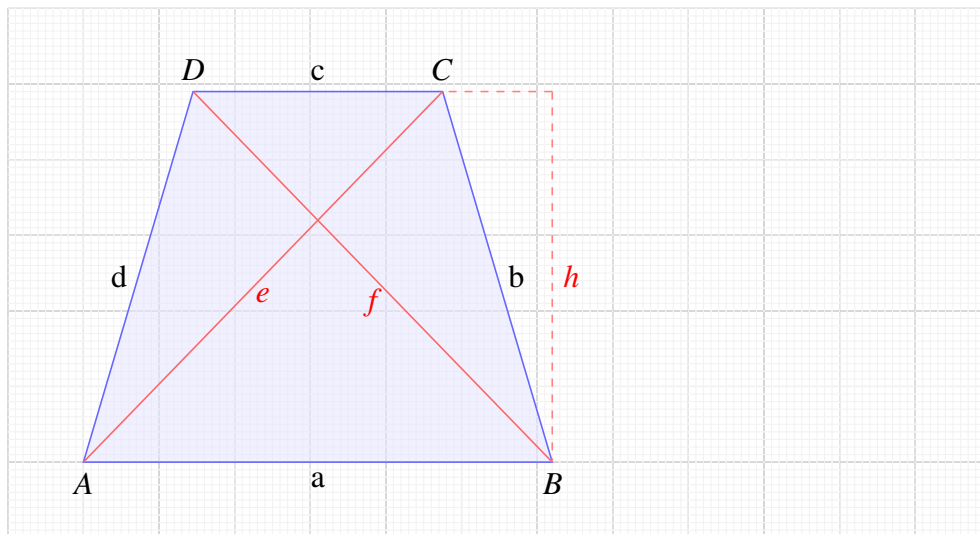
Phytagoras

$$e^2 = h^2 + (c+x)^2$$

$$e = \sqrt{h^2 + (c+x)^2} = \sqrt{44.0^2 + (42+13.5)^2} = \underline{70.8 \text{ mm}}$$

$$U = a + c + 2 \cdot b = 69 + 42 + 2 \cdot 46.0 = \underline{203.0 \text{ mm}}$$

57 $b = 51.1 \text{ mm}$, $c = 33 \text{ mm}$, $h = 49.0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{51.1^2 - 49.0^2} = 14.5 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 33 + 2 \cdot 14.5 = \underline{62 \text{ mm}}$$

Phytagoras

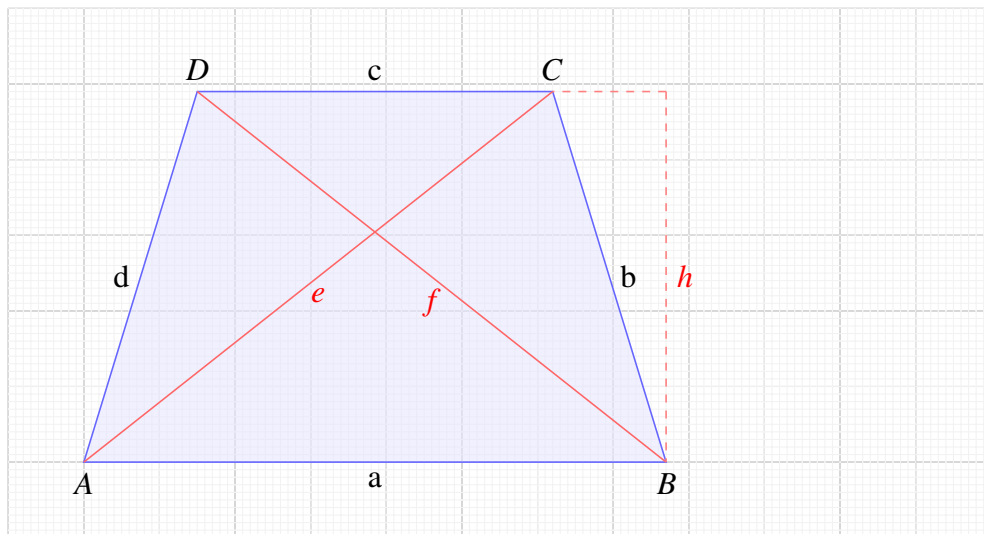
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{49.0^2 + (33 + 14.5)^2} = \underline{68.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{62 + 33}{2} \cdot 49.0 = \underline{2327.5 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 62 + 33 + 2 \cdot 51.1 = \underline{197.2 \text{ mm}}$$

58 $c = 47 \text{ mm}$, $e = 79.0 \text{ mm}$, $h = 49.0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow x = \sqrt{e^2 - h^2} - c = \sqrt{79.0^2 - 49.0^2} - 47 = 15.0 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 47 + 2 \cdot 15.0 = \underline{77 \text{ mm}}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{49.0^2 + 15.0^2} = \underline{51.2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{77 + 47}{2} \cdot 49.0 = \underline{3037.7 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 77 + 47 + 2 \cdot 51.2 = \underline{226.5 \text{ mm}}$$