

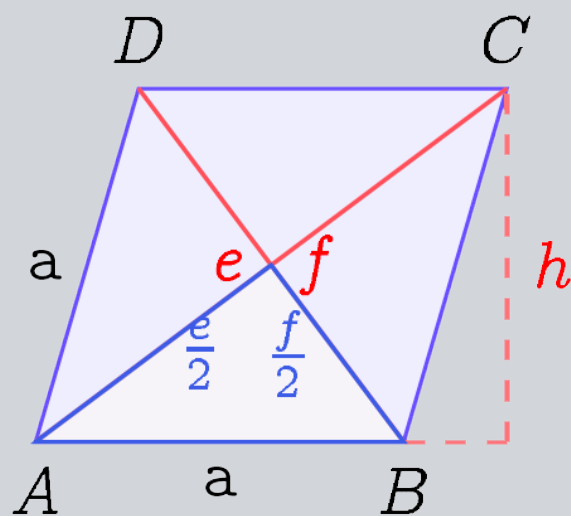
MATHEMATIK

Aufgabensammlung mit vollständigen Lösungen

Planimetrie II

Berechnungen am Viereck

50



NEO
LERNHILFEN



lizensiert für:
DI Edgar Neuherz



Arbeitsblätter

Mathematik
(2014-01-17 11:38)

Schuljahr
2012/13

Verantwortlich für den Inhalt
Dipl.-Ing. Edgar Neuherz

Graz, 2014

Wir weisen darauf hin, dass das Kopieren zum Schulgebrauch verboten ist - § 42 Absatz(6) der Urheberrechtsgesetznovelle 2003:

„Die Befugnis zur Vervielfältigung zum eigenen Schulgebrauch gilt nicht für Werke, die ihrer Beschaffenheit und Bezeichnung nach zum Schul- oder Unterrichtsgebrauch bestimmt sind.“

© 2011-2014 DI Edgar Neuherz
Strauchergasse 23, A-8020 Graz
Alle Rechte vorbehalten.

Dieses Werk ist urheberrechtlich geschützt. Die dadurch begründeten Rechte, insbesondere das der Übersetzung, des Nachdrucks, der Entnahme von Abbildungen, der Funksendung, der Wiedergabe auf fotomechanischem oder ähnlichem Wege und der Speicherung in Datenverarbeitungsanlagen, bleiben, auch bei nur auszugsweise Verwertung, vorbehalten.

ISBN
NEO Website: mathematik.neo-lernhilfen.at

E-Mail an neo.verlag@me.com

Inhaltsverzeichnis

1	Aufgaben	1
1.1	Gleichungssysteme	3
1.1.1	Quadrat, Rechteck	3
1.1.2	Parallelogramm	3
1.1.3	Rhombus	3
1.1.4	Allgemeines Trapez	4
1.1.5	Gleichschenkeliges Trapez	5
2	Lösungen	7
2.1	Gleichungssysteme	9
2.1.1	Quadrat, Rechteck	9
2.1.2	Parallelogramm	19
2.1.3	Rhombus	29
2.1.4	Allgemeines Trapez	39
2.1.5	Gleichschenkeliges Trapez	53

1

Aufgaben

1.1 Gleichungssysteme

1.1.1 Quadrat, Rechteck

Gegeben ist ein Rechteck bzw. Quadrat mit nachfolgenden Daten. Die Werte für a , b , d , A und U sind zu vervollständigen und zu berechnen!

11:38 **1**
2014-01-17

1 $a = 82 \text{ mm}, b = 40 \text{ mm}.$

6 $b = 70 \text{ mm}, U = 256 \text{ mm}.$

2 $a = 89 \text{ mm}, b = 41 \text{ mm}.$

7 $a = 63 \text{ mm}, d = 97 \text{ mm}.$

3 $a = 75 \text{ mm}, A = 4500 \text{ mm}^2.$

8 $b = 88 \text{ mm}, d = 104 \text{ mm}.$

4 $b = 73 \text{ mm}, A = 2993 \text{ mm}^2.$

9 $a = 67 \text{ mm}, b = 86 \text{ mm}.$

5 $a = 43 \text{ mm}, U = 190 \text{ mm}.$

10 $a = 78 \text{ mm}, b = 74 \text{ mm}.$

1.1.2 Parallelogramm

Gegeben ist ein Parallelogramm mit nachfolgenden Daten. Die Werte für a , b , e , f , h_a , h_b , A und U sind zu vervollständigen und zu berechnen!

11:38 **2**
2014-01-17

11 $a = 50 \text{ mm}, b = 50 \text{ mm}, h_a = 35,4 \text{ mm}.$

16 $b = 52 \text{ mm}, f = 57,8 \text{ mm}, h_a = 47,0 \text{ mm}.$

12 $a = 59 \text{ mm}, b = 57 \text{ mm}, A = 2291,8 \text{ mm}^2.$

17 $a = 55 \text{ mm}, h_b = 47,8 \text{ mm}, A = 2726 \text{ mm}^2.$

13 $a = 63 \text{ mm}, b = 61 \text{ mm}, h_b = 53,2 \text{ mm}.$

18 $a = 45 \text{ mm}, b = 70 \text{ mm}, f = 65,4 \text{ mm}.$

14 $a = 55 \text{ mm}, b = 61 \text{ mm}, A = 2105 \text{ mm}^2.$

19 $a = 50 \text{ mm}, b = 77 \text{ mm}, h_a = 74,9 \text{ mm}.$

15 $b = 58 \text{ mm}, e = 119,9 \text{ mm}, h_a = 36,1 \text{ mm}.$

20 $a = 41 \text{ mm}, b = 47 \text{ mm}, A = 1559,2 \text{ mm}^2.$

1.1.3 Rhombus

Gegeben ist ein Rhombus mit nachfolgenden Daten. Die Werte für a , e , f , h , A und U sind zu vervollständigen und zu berechnen!

11:38 **3**
2014-01-17

21 $e = 142,3 \text{ mm}, f = 58,8 \text{ mm}.$

26 $e = 102,5 \text{ mm}, A = 2313,6 \text{ mm}^2.$

22 $a = 52 \text{ mm}, e = 83,5 \text{ mm}.$

27 $e = 73,9 \text{ mm}, h = 37,8 \text{ mm}.$

23 $a = 64 \text{ mm}, f = 67,8 \text{ mm}.$

28 $A = 2870,4 \text{ mm}^2, U = 252 \text{ mm}.$

24 $a = 78 \text{ mm}, h = 69,7 \text{ mm}.$

29 $e = 117,2 \text{ mm}, f = 40,4 \text{ mm}.$

25 $a = 54 \text{ mm}, A = 2068,6 \text{ mm}^2.$

30 $a = 43 \text{ mm}, e = 66,9 \text{ mm}.$

1.1.4 Allgemeines Trapez

11:38 **4**
2014-01-17

Gegeben ist ein Trapez mit nachfolgenden Daten. Die Werte für a , b , c , d , e , f , h , A und U sind zu vervollständigen und zu berechnen!

31 $a = 77 \text{ mm}$, $b = 44,4 \text{ mm}$, $c = 44 \text{ mm}$, $d = 48,2 \text{ mm}$.

32 $a = 64 \text{ mm}$, $b = 51,5 \text{ mm}$, $d = 56,0 \text{ mm}$, $f = 61,3 \text{ mm}$.

33 $a = 67 \text{ mm}$, $c = 44 \text{ mm}$, $d = 42,5 \text{ mm}$, $f = 66,2 \text{ mm}$.

34 $a = 87 \text{ mm}$, $c = 47 \text{ mm}$, $d = 53,3 \text{ mm}$, $e = 86,1 \text{ mm}$.

35 $a = 67 \text{ mm}$, $c = 44 \text{ mm}$, $f = 64,9 \text{ mm}$, $A = 2219,9 \text{ mm}^2$.

36 $a = 60 \text{ mm}$, $c = 31 \text{ mm}$, $d = 51,4 \text{ mm}$, $h = 47,0 \text{ mm}$.

37 $b = 42,9 \text{ mm}$, $c = 33 \text{ mm}$, $d = 45,4 \text{ mm}$, $f = 61,2 \text{ mm}$.

38 $a = 77 \text{ mm}$, $d = 58,7 \text{ mm}$, $f = 64,6 \text{ mm}$, $A = 2616,0 \text{ mm}^2$.

39 $a = 63 \text{ mm}$, $b = 45,6 \text{ mm}$, $c = 25 \text{ mm}$, $d = 54,3 \text{ mm}$.

40 $a = 76 \text{ mm}$, $b = 42,8 \text{ mm}$, $d = 49,3 \text{ mm}$, $f = 65,4 \text{ mm}$.

41 $a = 76 \text{ mm}$, $c = 39 \text{ mm}$, $d = 49,6 \text{ mm}$, $f = 66,9 \text{ mm}$.

42 $a = 74 \text{ mm}$, $c = 40 \text{ mm}$, $d = 47,6 \text{ mm}$, $e = 76,1 \text{ mm}$.

43 $a = 88 \text{ mm}$, $c = 48 \text{ mm}$, $f = 74,2 \text{ mm}$, $A = 2856,2 \text{ mm}^2$.

44 $a = 73 \text{ mm}$, $c = 32 \text{ mm}$, $d = 55,6 \text{ mm}$, $h = 46,0 \text{ mm}$.

1.1.5 Gleichschenkeliges Trapez

Gegeben ist ein gleichschenkeliges Trapez ($b = d$) mit nachfolgenden Daten. Die Werte für a , b , c , e , h , A und U sind zu vervollständigen und zu berechnen!

11:38 **5**
2014-01-17

- 45 $a = 80 \text{ mm}, b = 50,2 \text{ mm}, h = 46,0 \text{ mm}.$
- 46 $a = 79 \text{ mm}, b = 54,1 \text{ mm}, c = 29 \text{ mm}.$
- 47 $a = 69 \text{ mm}, b = 48,6 \text{ mm}, U = 210,3 \text{ mm}.$
- 48 $a = 84 \text{ mm}, c = 27 \text{ mm}, A = 2497,8 \text{ mm}^2.$
- 49 $b = 41,9 \text{ mm}, c = 45 \text{ mm}, h = 41,0 \text{ mm}.$
- 50 $c = 48 \text{ mm}, e = 69,0 \text{ mm}, h = 43,0 \text{ mm}.$
- 51 $a = 72 \text{ mm}, e = 63,3 \text{ mm}, h = 40,0 \text{ mm}.$
- 52 $a = 84 \text{ mm}, b = 53,4 \text{ mm}, e = 77,2 \text{ mm}.$
- 53 $a = 74 \text{ mm}, b = 54,1 \text{ mm}, h = 48,0 \text{ mm}.$
- 54 $a = 72 \text{ mm}, b = 51,8 \text{ mm}, c = 33 \text{ mm}.$
- 55 $a = 80 \text{ mm}, b = 48,3 \text{ mm}, U = 212,6 \text{ mm}.$
- 56 $a = 84 \text{ mm}, c = 32 \text{ mm}, A = 2436,2 \text{ mm}^2.$
- 57 $b = 44,0 \text{ mm}, c = 42 \text{ mm}, h = 42,0 \text{ mm}.$
- 58 $c = 49 \text{ mm}, e = 76,8 \text{ mm}, h = 44,0 \text{ mm}.$

2

Lösungen

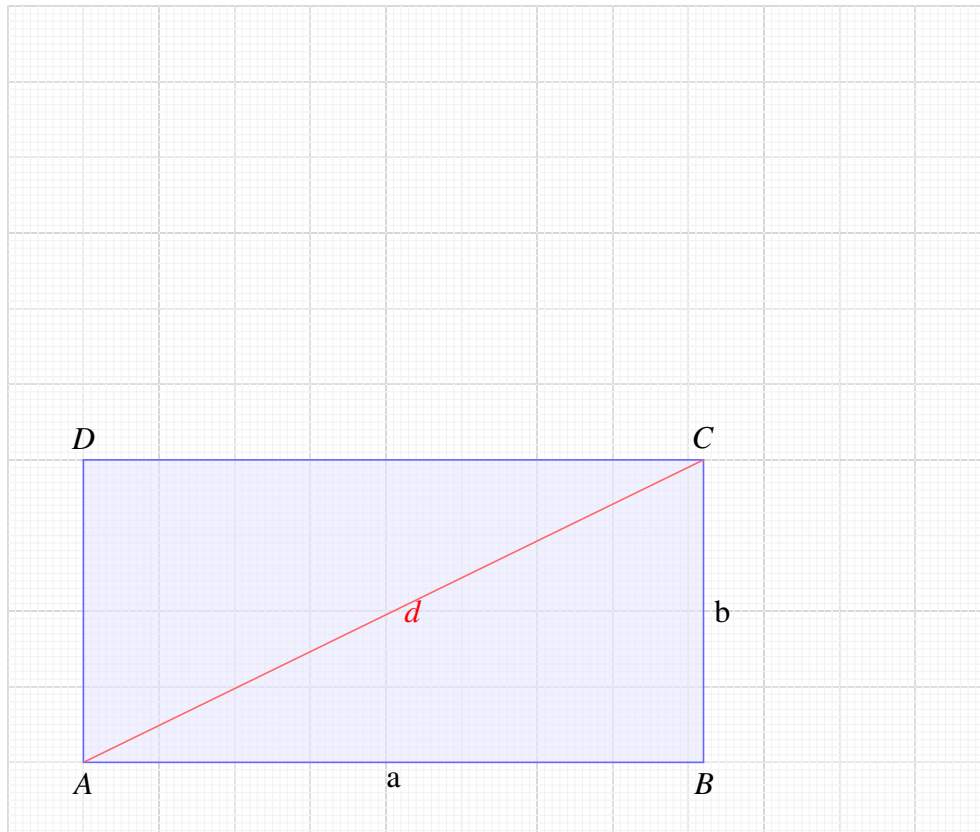
2.1 Gleichungssysteme

2.1.1 Quadrat, Rechteck

Gegeben ist ein Rechteck bzw. Quadrat mit nachfolgenden Daten. Die Werte für a , b , d , A und U sind zu vervollständigen und zu berechnen!

11:38 **1**
2014-01-17

1 $a = 82 \text{ mm}$, $b = 40 \text{ mm}$.



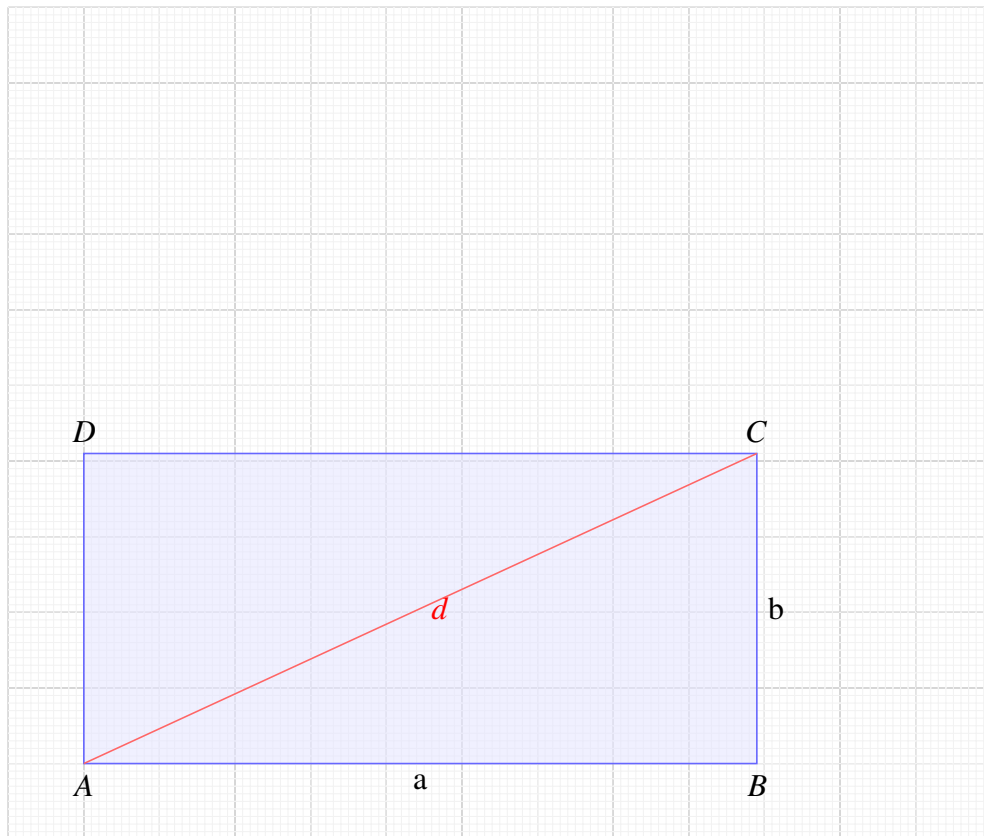
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{82^2 + 40^2} = \underline{91,2 \text{ mm}}$$

$$A = a \cdot b = 82 \cdot 40 = \underline{3280 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (82 + 40) = \underline{244 \text{ mm}}$$

$$2 \quad a = 89 \text{ mm}, b = 41 \text{ mm.}$$



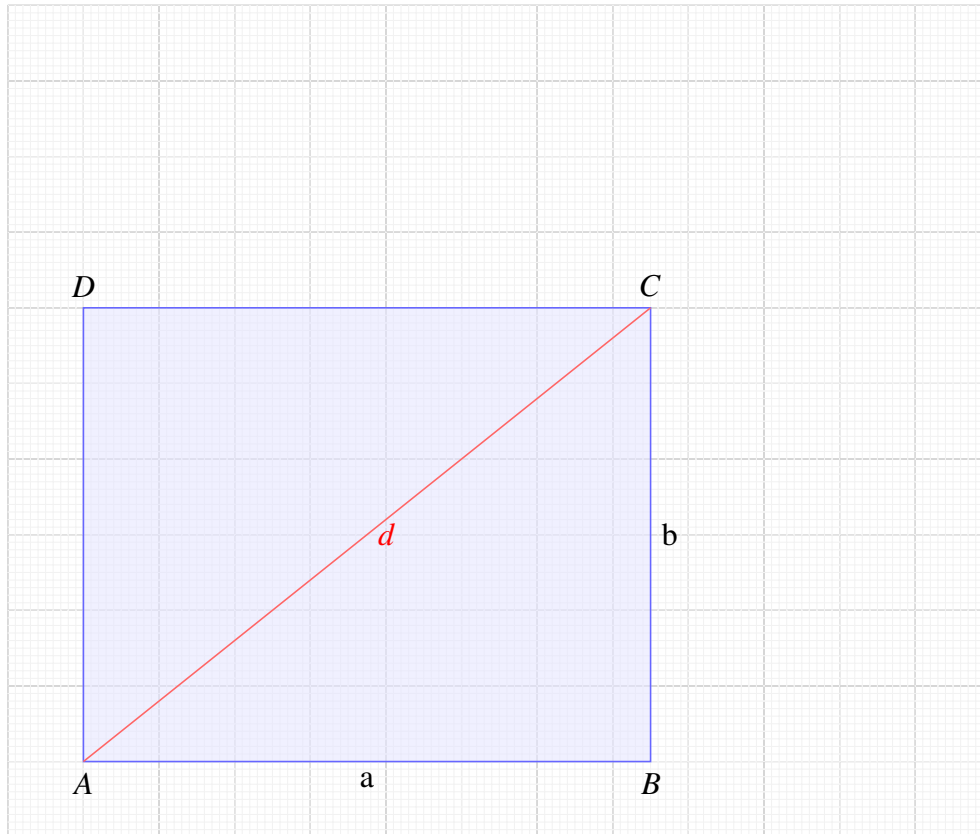
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{89^2 + 41^2} = \underline{98,0 \text{ mm}}$$

$$A = a \cdot b = 89 \cdot 41 = \underline{3649 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (89 + 41) = \underline{260 \text{ mm}}$$

3 $a = 75 \text{ mm}, A = 4500 \text{ mm}^2.$



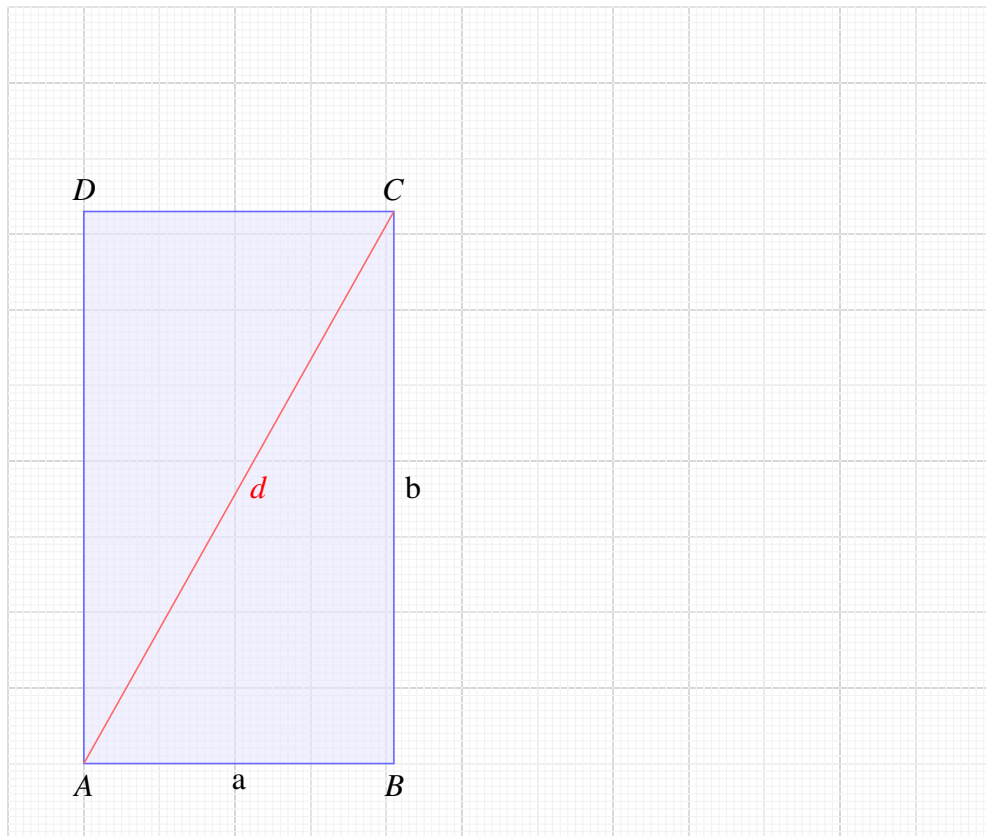
$$A = a \cdot b \Rightarrow b = \frac{A}{a} = \frac{4500}{75} = \underline{60 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{75^2 + 60^2} = \underline{96,0 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (75 + 60) = \underline{270 \text{ mm}}$$

4 $b = 73 \text{ mm}, A = 2993 \text{ mm}^2.$



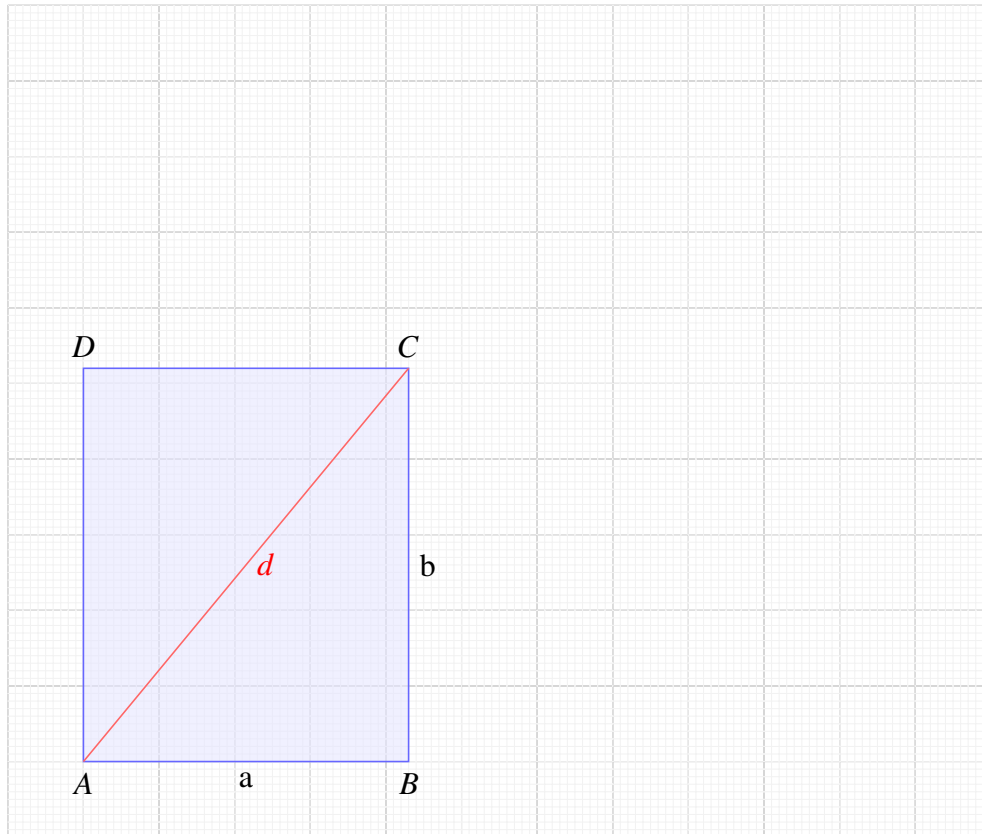
$$A = a \cdot b \Rightarrow a = \frac{A}{b} = \frac{2993}{73} = \underline{41 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{41^2 + 73^2} = \underline{83,7 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (41 + 73) = \underline{228 \text{ mm}}$$

5 $a = 43 \text{ mm}, U = 190 \text{ mm}.$



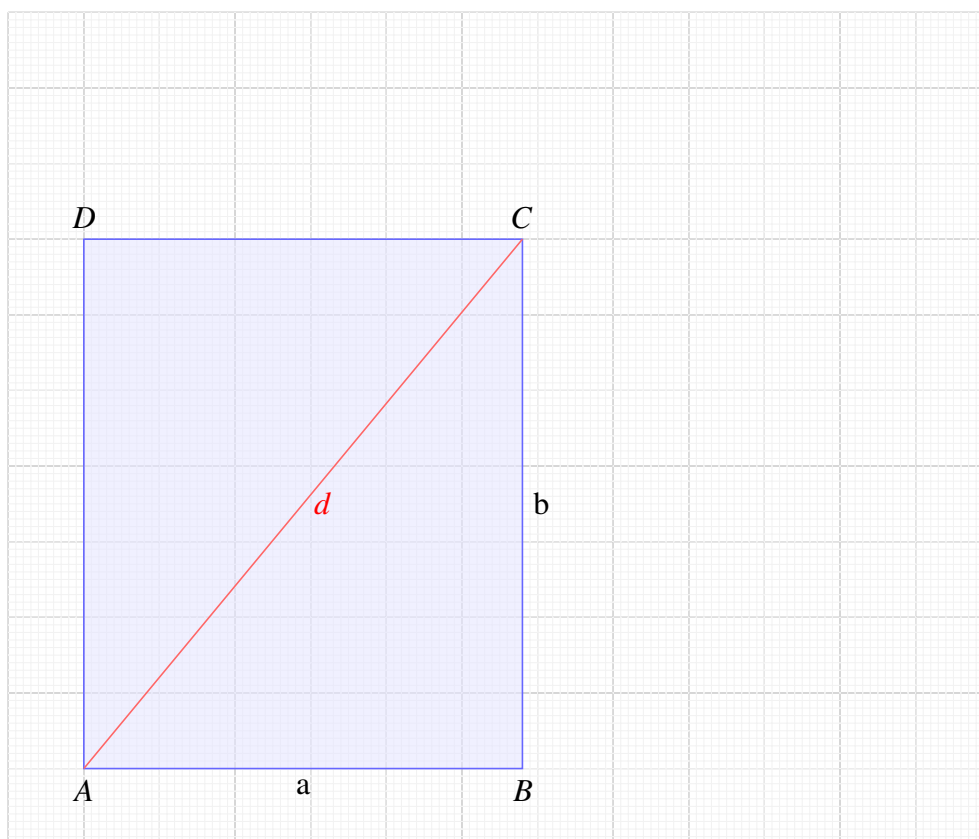
$$U = 2 \cdot (a + b) \Rightarrow b = \frac{U}{2} - a = \frac{190}{2} - 43 = \underline{52 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{43^2 + 52^2} = \underline{67,5 \text{ mm}}$$

$$A = a \cdot b = 43 \cdot 52 = \underline{2236 \text{ mm}}$$

6 $b = 70 \text{ mm}, U = 256 \text{ mm}.$



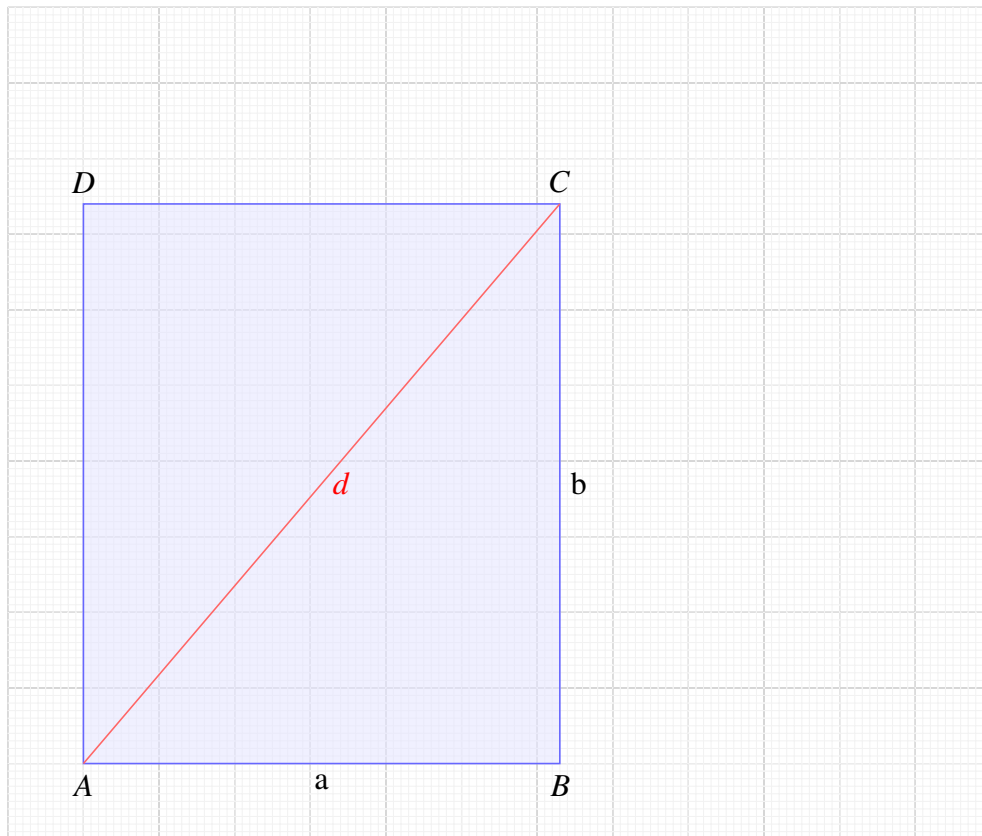
$$U = 2 \cdot (a + b) \Rightarrow a = \frac{U}{2} - b = \frac{256}{2} - 70 = \underline{58 \text{ mm}}$$

Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{58^2 + 70^2} = \underline{90,9 \text{ mm}}$$

$$A = a \cdot b = 58 \cdot 70 = \underline{4060 \text{ mm}}$$

7 $a = 63 \text{ mm}, d = 97 \text{ mm}.$



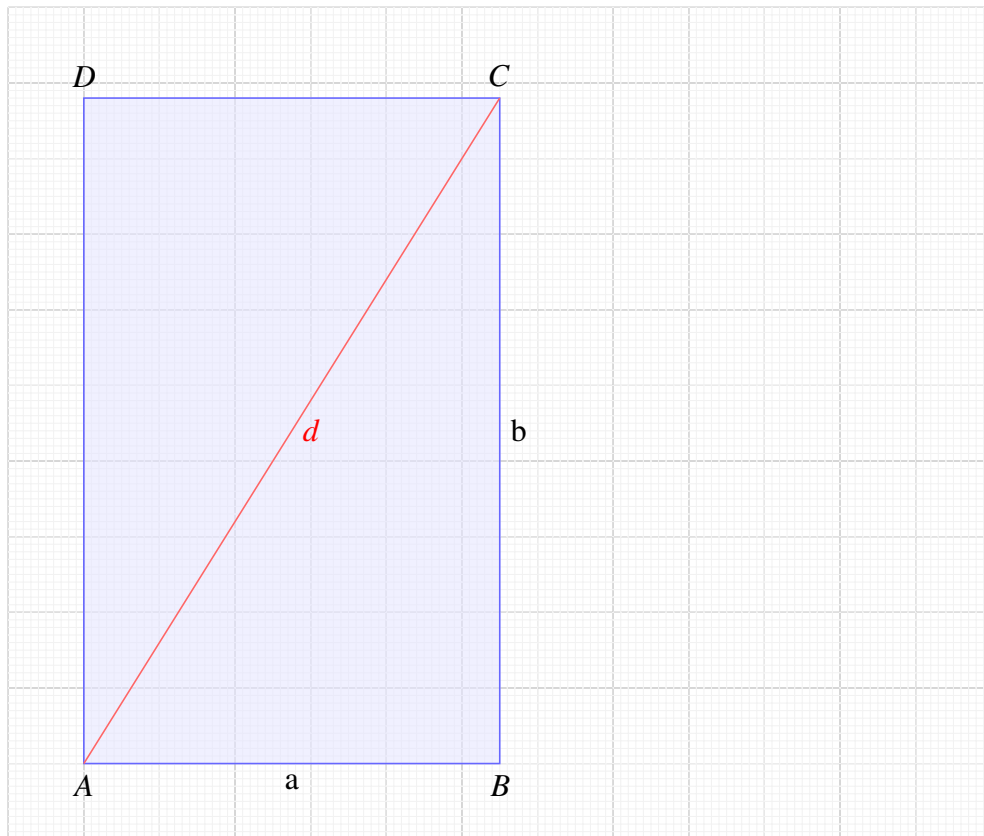
Phytagoras

$$b = \sqrt{d^2 - a^2} = \sqrt{97,2^2 - 63^2} = \underline{74 \text{ mm}}$$

$$A = a \cdot b = 63 \cdot 74 = \underline{4662 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (63 + 74) = \underline{274 \text{ mm}}$$

8 $b = 88 \text{ mm}, d = 104 \text{ mm}.$



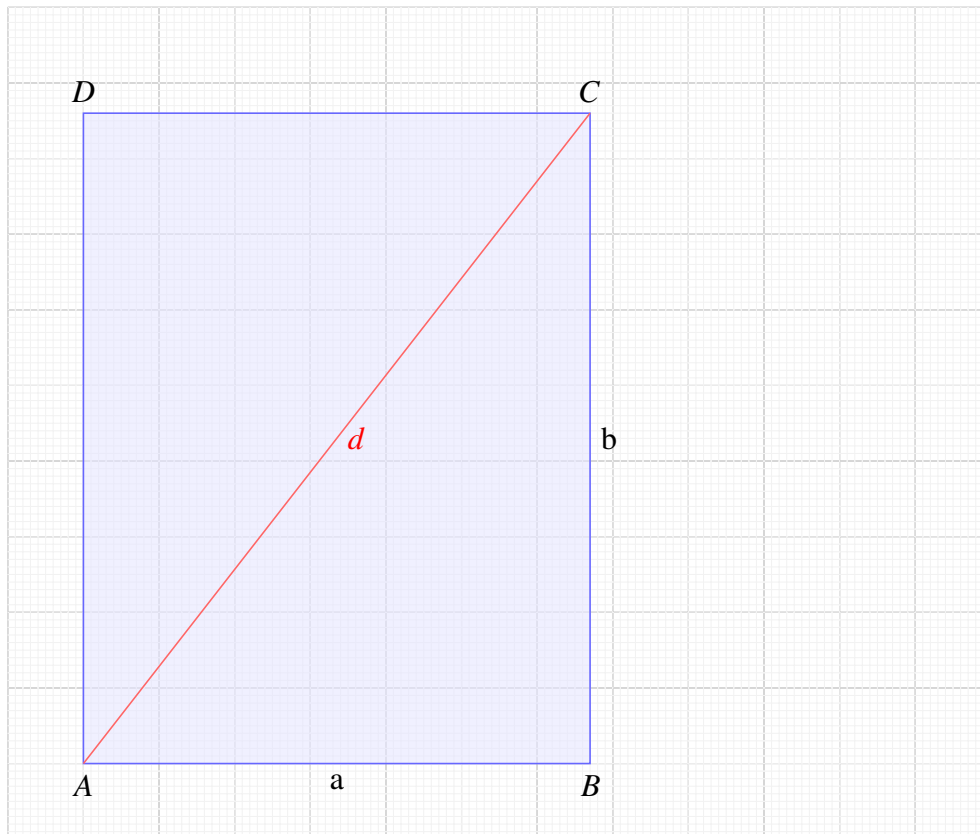
Phytagoras

$$a = \sqrt{d^2 - b^2} = \sqrt{103,8^2 - 88^2} = \underline{55 \text{ mm}}$$

$$A = a \cdot b = 55 \cdot 88 = \underline{4840 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (55 + 88) = \underline{286 \text{ mm}}$$

9 $a = 67 \text{ mm}$, $b = 86 \text{ mm}$.



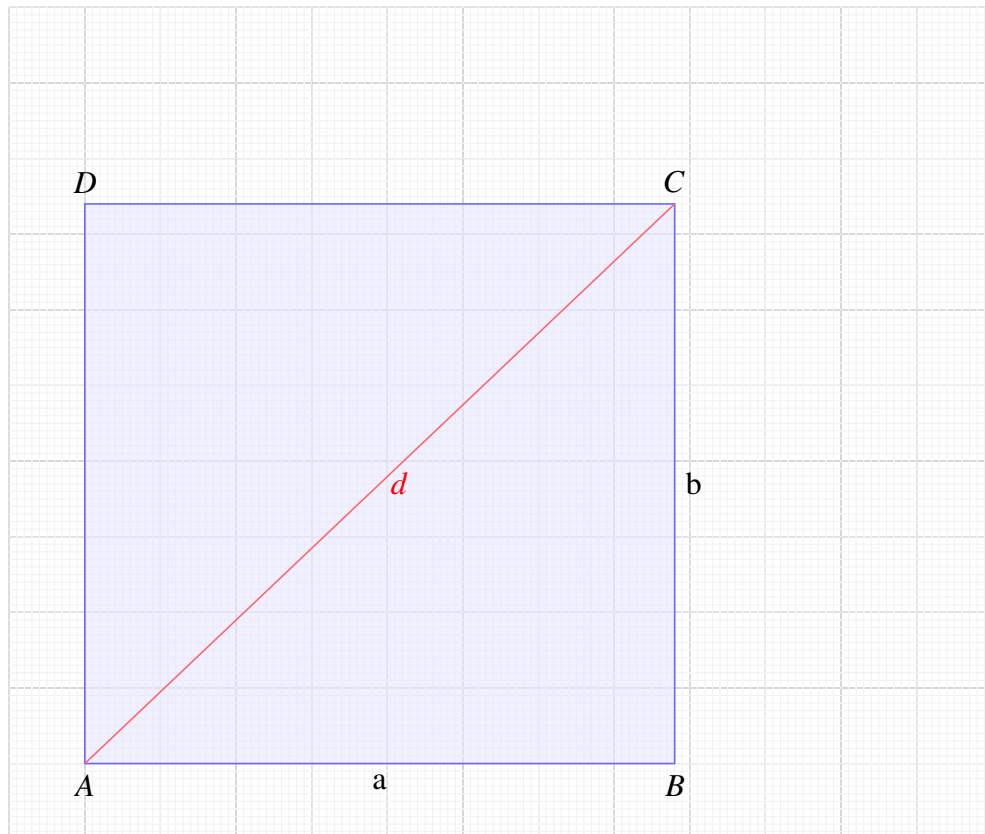
Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{67^2 + 86^2} = \underline{109,0 \text{ mm}}$$

$$A = a \cdot b = 67 \cdot 86 = \underline{5762 \text{ mm}}$$

$$U = 2 \cdot (a + b) = 2 \cdot (67 + 86) = \underline{306 \text{ mm}}$$

10 $a = 78 \text{ mm}, b = 74 \text{ mm}.$



Phytagoras

$$d = \sqrt{a^2 + b^2} = \sqrt{78^2 + 74^2} = \underline{107,5 \text{ mm}}$$

$$A = a \cdot b = 78 \cdot 74 = \underline{5772 \text{ mm}}$$

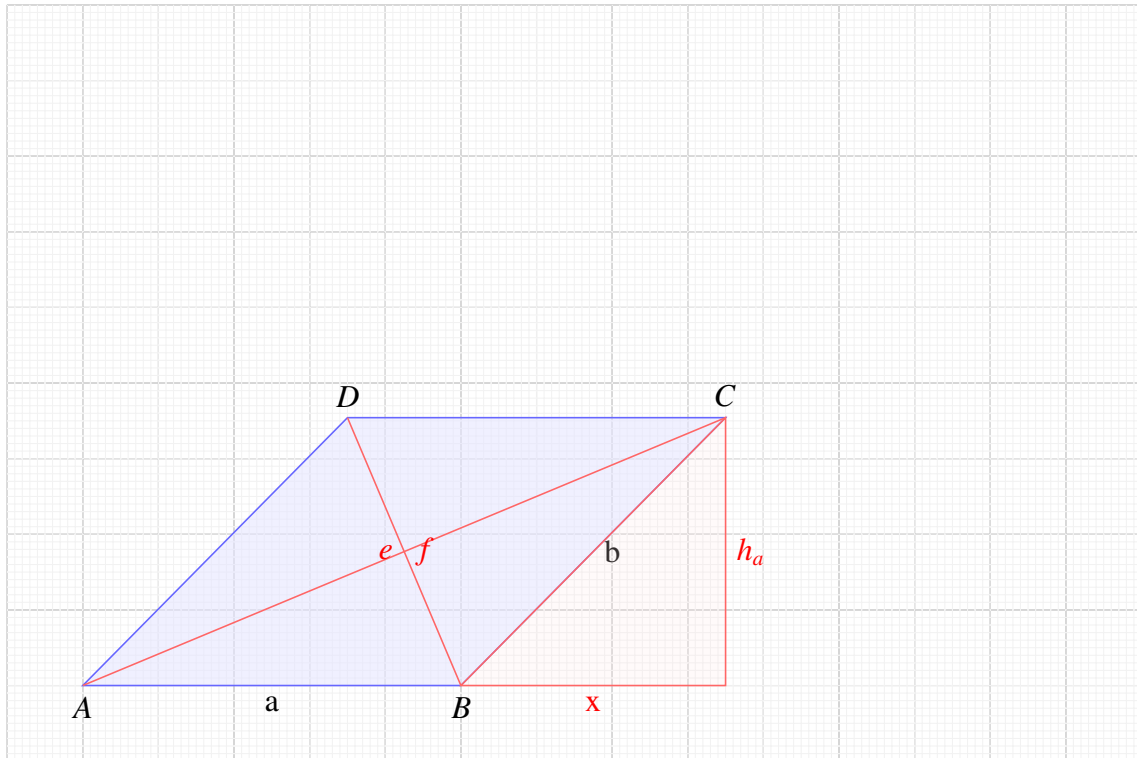
$$U = 2 \cdot (a + b) = 2 \cdot (78 + 74) = \underline{304 \text{ mm}}$$

2.1.2 Parallelogramm

Gegeben ist ein Parallelogramm mit nachfolgenden Daten. Die Werte für a , b , e , f , h_a , h_b , A und U sind zu vervollständigen und zu berechnen!

11:38 **2**
2014-01-17

11 $a = 50 \text{ mm}$, $b = 50 \text{ mm}$, $h_a = 35,4 \text{ mm}$.



$$A = a \cdot h_a = 50 \cdot 35,4 = \underline{1771 \text{ mm}^2}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{50^2 - 35,4^2} = 35,3 \text{ mm}$$

Phytagoras

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

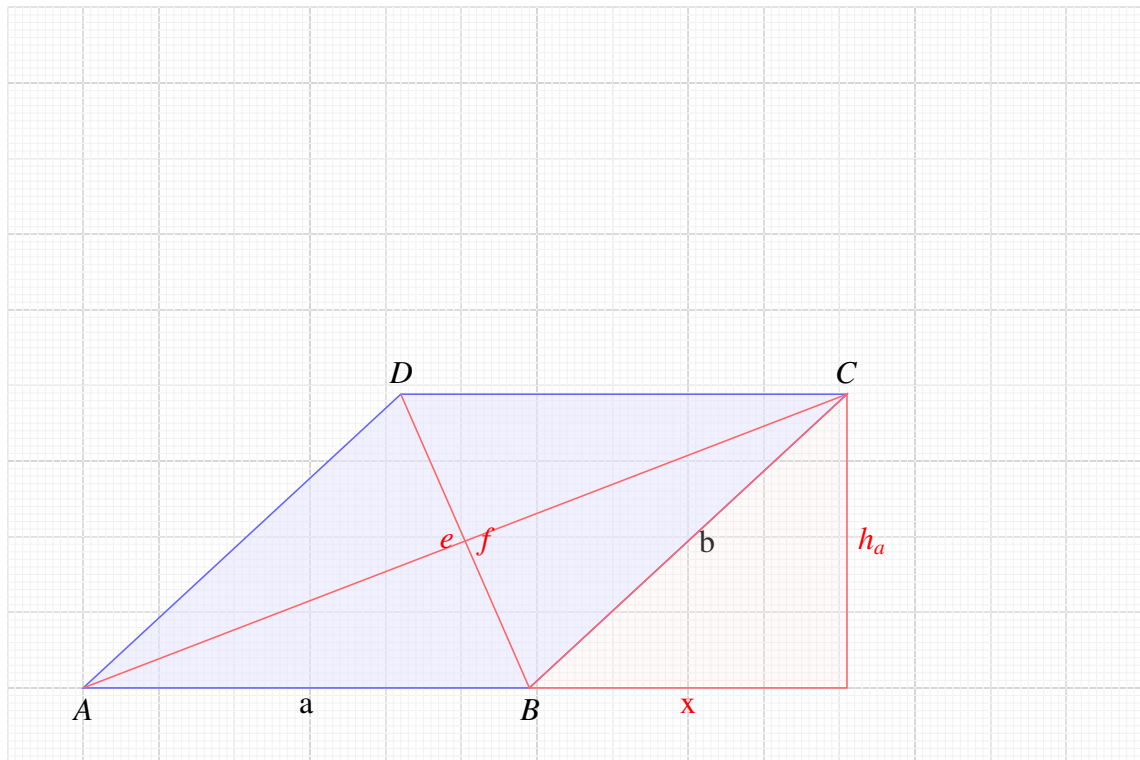
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{35,4^2 + (50 + 35,3)^2} = \underline{92,4 \text{ mm}}$$

Phytagoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{35,4^2 + (50 - 35,3)^2} = \underline{38,4 \text{ mm}}$$

12 $a = 59 \text{ mm}, b = 57 \text{ mm}, A = 2291,8 \text{ mm}^2$.



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2291,8}{59} = \underline{38,8 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2291,8}{57} = \underline{40,2 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{57^2 - 38,8^2} = 41,7 \text{ mm}$$

Phytagoras

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

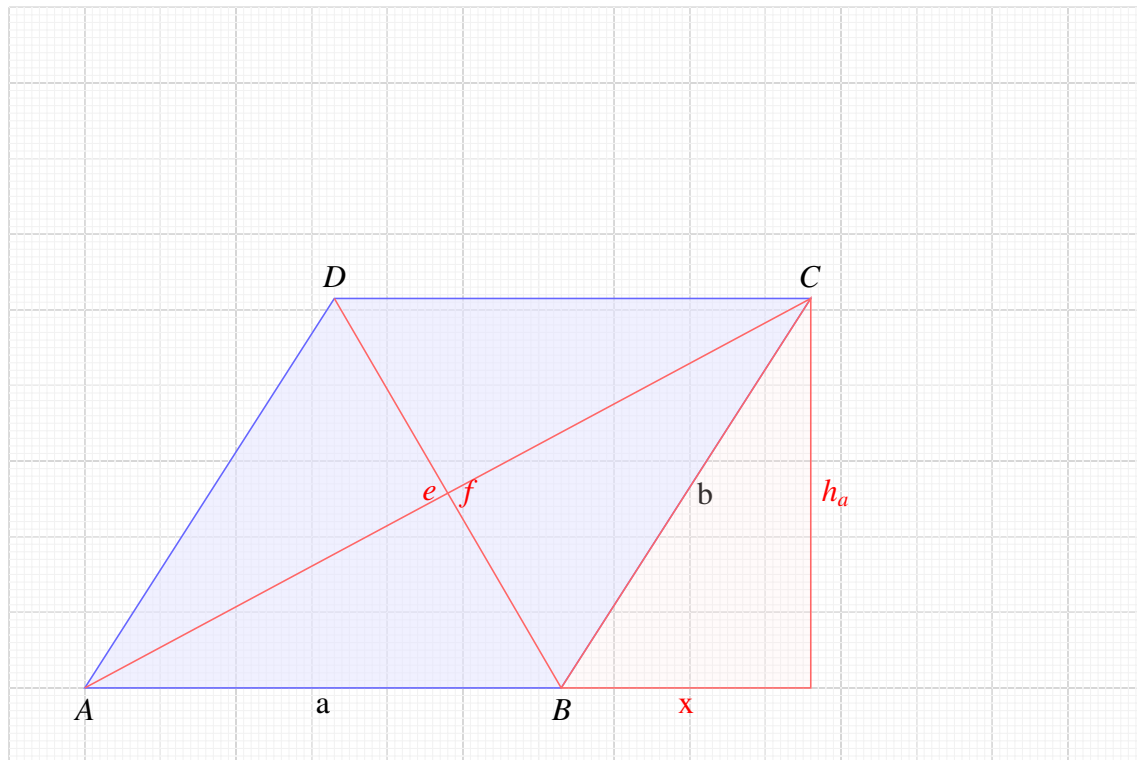
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{38,8^2 + (59 + 41,7)^2} = \underline{107,9 \text{ mm}}$$

Phytagoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{38,8^2 + (59 - 41,7)^2} = \underline{42,5 \text{ mm}}$$

13 $a = 63 \text{ mm}, b = 61 \text{ mm}, h_b = 53,2 \text{ mm}.$



$$A = b \cdot h_b = 61 \cdot 53,2 = \underline{3244,8 \text{ mm}^2}$$

$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{3244,8}{63} = \underline{51,5 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{61^2 - 51,5^2} = 32,7 \text{ mm}$$

Phytagoras

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

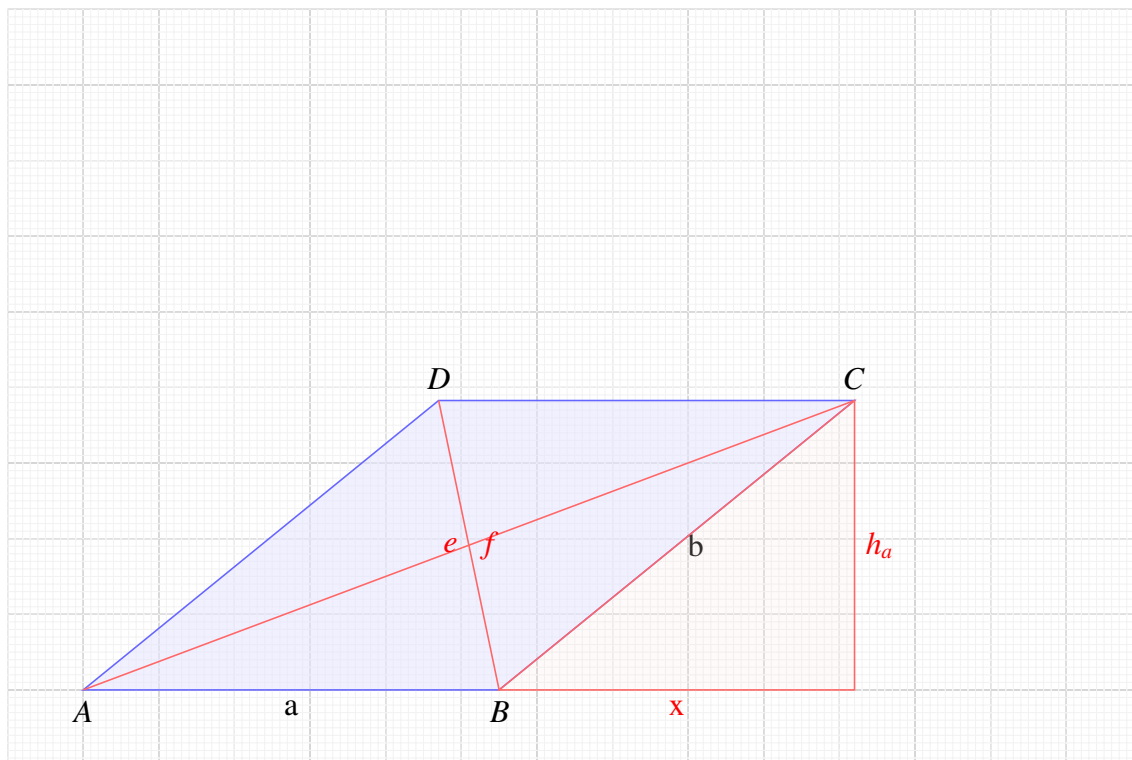
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{51,5^2 + (63 + 32,7)^2} = \underline{108,7 \text{ mm}}$$

Phytagoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{51,5^2 + (63 - 32,7)^2} = \underline{59,8 \text{ mm}}$$

14 $a = 55 \text{ mm}, b = 61 \text{ mm}, A = 2105 \text{ mm}^2$.



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2105}{55} = \underline{38,3 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2105}{61} = \underline{34,5 \text{ mm}}$$

Phytgoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{61^2 - 38,3^2} = 47,5 \text{ mm}$$

Phytgoras

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

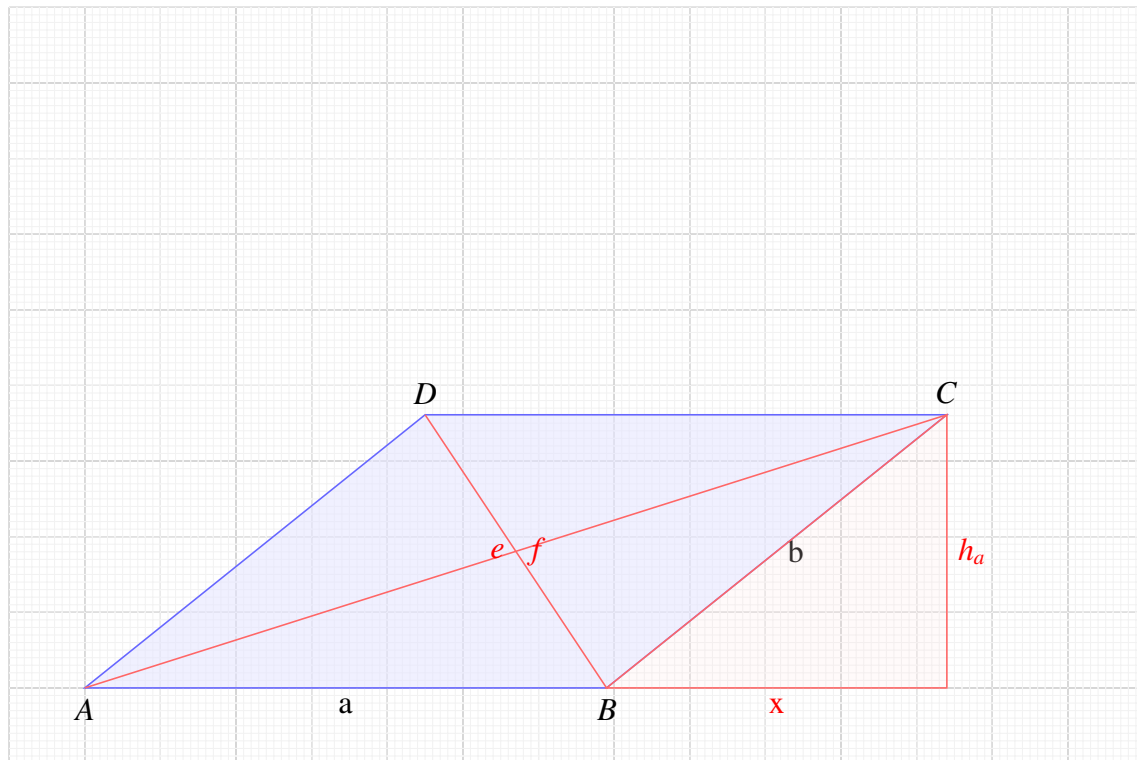
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{38,3^2 + (55 + 47,5)^2} = \underline{109,4 \text{ mm}}$$

Phytgoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{38,3^2 + (55 - 47,5)^2} = \underline{39,0 \text{ mm}}$$

15 $b = 58 \text{ mm}$, $e = 119,9 \text{ mm}$, $h_a = 36,1 \text{ mm}$.



Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{58^2 - 36,1^2} = 45,4 \text{ mm}$$

Phytagoras

$$e^2 = h_a^2 + (a + x)^2 \Rightarrow a = \sqrt{e^2 - h_a^2} - x = \sqrt{119,9^2 - 36,1^2} - 45,4 = \underline{69 \text{ mm}}$$

$$A = a \cdot h_a = 69 \cdot 36,1 = \underline{2492,2 \text{ mm}^2}$$

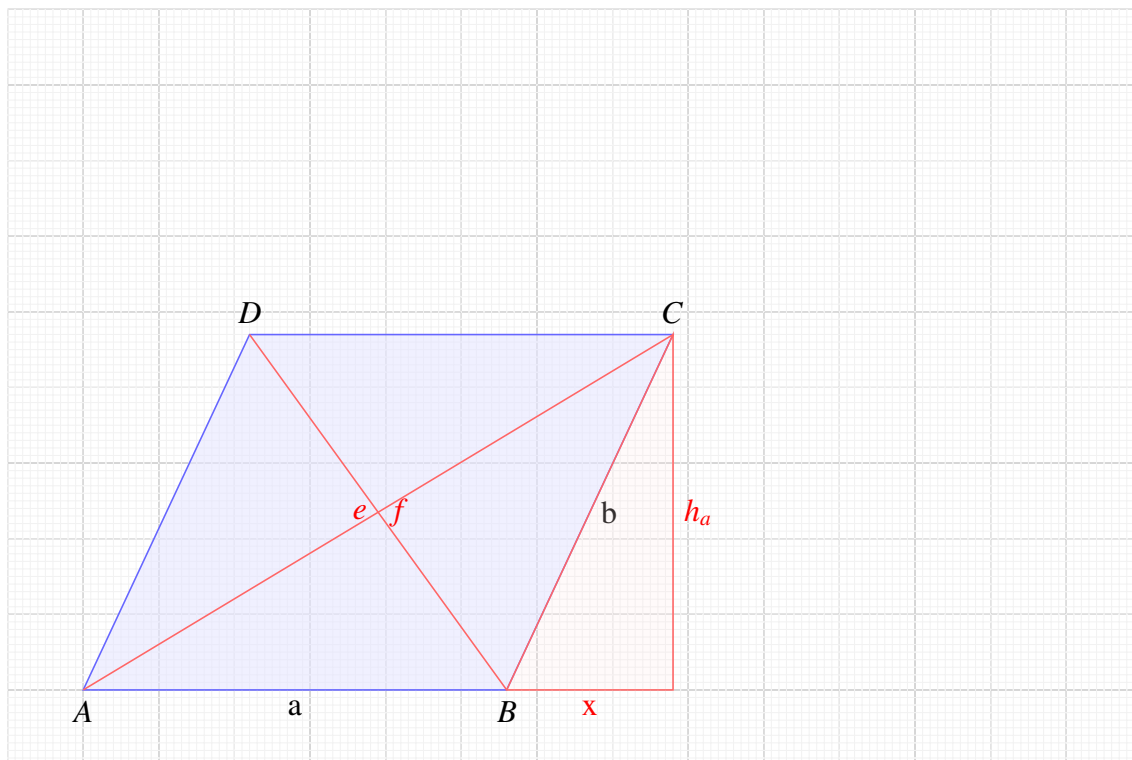
Phytagoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{36,1^2 + (69 - 45,4)^2} = \underline{43,2 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2492,2}{58} = \underline{43,0 \text{ mm}}$$

16 $b = 52 \text{ mm}, f = 57,8 \text{ mm}, h_a = 47,0 \text{ mm}.$



Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{52^2 - 47,0^2} = 22,3 \text{ mm}$$

Phytagoras

$$f^2 = h_a^2 + (a - x)^2 \Rightarrow a = \sqrt{f^2 - h_a^2} + x = \sqrt{57,8^2 - 47,0^2} + 22,3 = \underline{56 \text{ mm}}$$

$$A = a \cdot h_a = 56 \cdot 47,0 = \underline{2631,2 \text{ mm}^2}$$

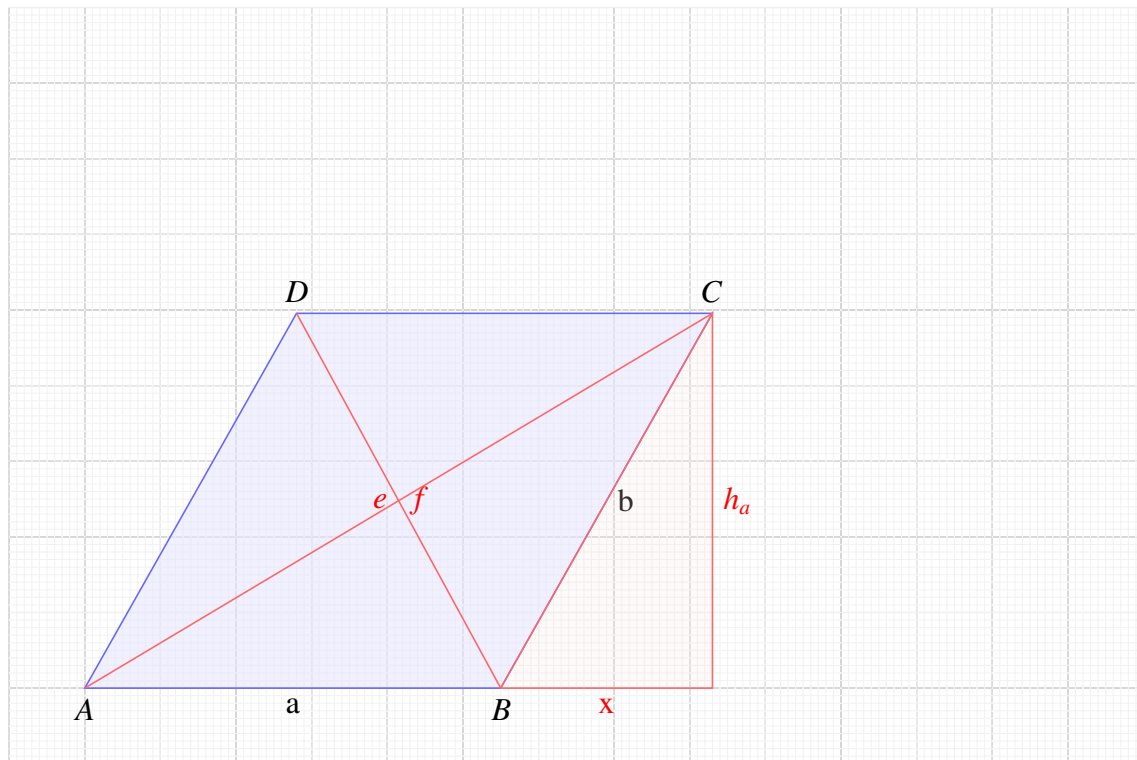
Phytagoras

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

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{47,0^2 + (56 + 22,3)^2} = \underline{91,3 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2631,2}{52} = \underline{50,6 \text{ mm}}$$

17 $a = 55 \text{ mm}$, $h_b = 47,8 \text{ mm}$, $A = 2726 \text{ mm}^2$.



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

$$b = \frac{A}{h_b} = \frac{2726}{47,8} = \underline{57 \text{ mm}}$$

$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{2726}{55} = \underline{49,6 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{57^2 - 49,6^2} = 28,2 \text{ mm}$$

Phytagoras

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

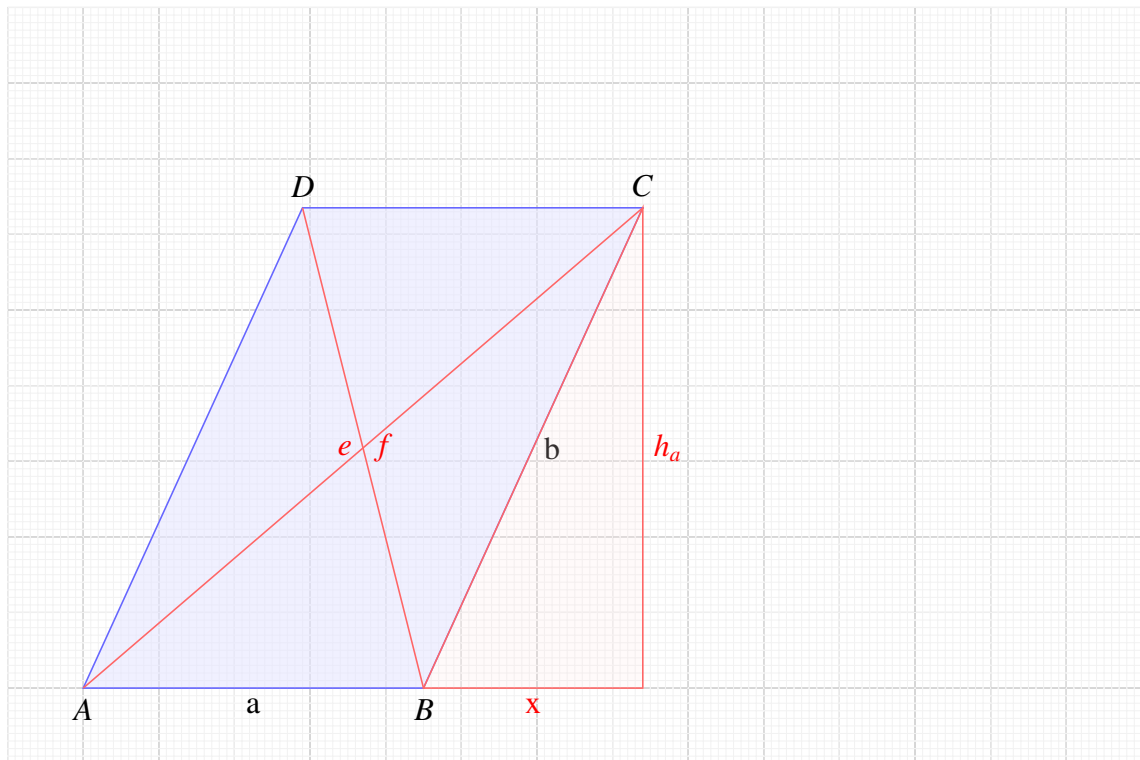
$$e = \sqrt{h_a^2 + (a+x)^2} = \sqrt{49,6^2 + (55 + 28,2)^2} = \underline{96,8 \text{ mm}}$$

Phytagoras

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

$$f = \sqrt{h_a^2 + (a-x)^2} = \sqrt{49,6^2 + (55 - 28,2)^2} = \underline{56,4 \text{ mm}}$$

18 $a = 45 \text{ mm}, b = 70 \text{ mm}, f = 65,4 \text{ mm}.$



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

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

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

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

$$f^2 - b^2 = a^2 - 2ax \Rightarrow x = \frac{a^2 + b^2 - f^2}{2 \cdot a} = \frac{45^2 + 70^2 - 65,4^2}{2 \cdot 45} = 29,4 \text{ mm}$$

Phytgoras

$$b^2 = h_a^2 + x^2 \Rightarrow h_a = \sqrt{b^2 - x^2} = \sqrt{70^2 - 29,4^2} = \underline{63,5 \text{ mm}}$$

Phytgoras

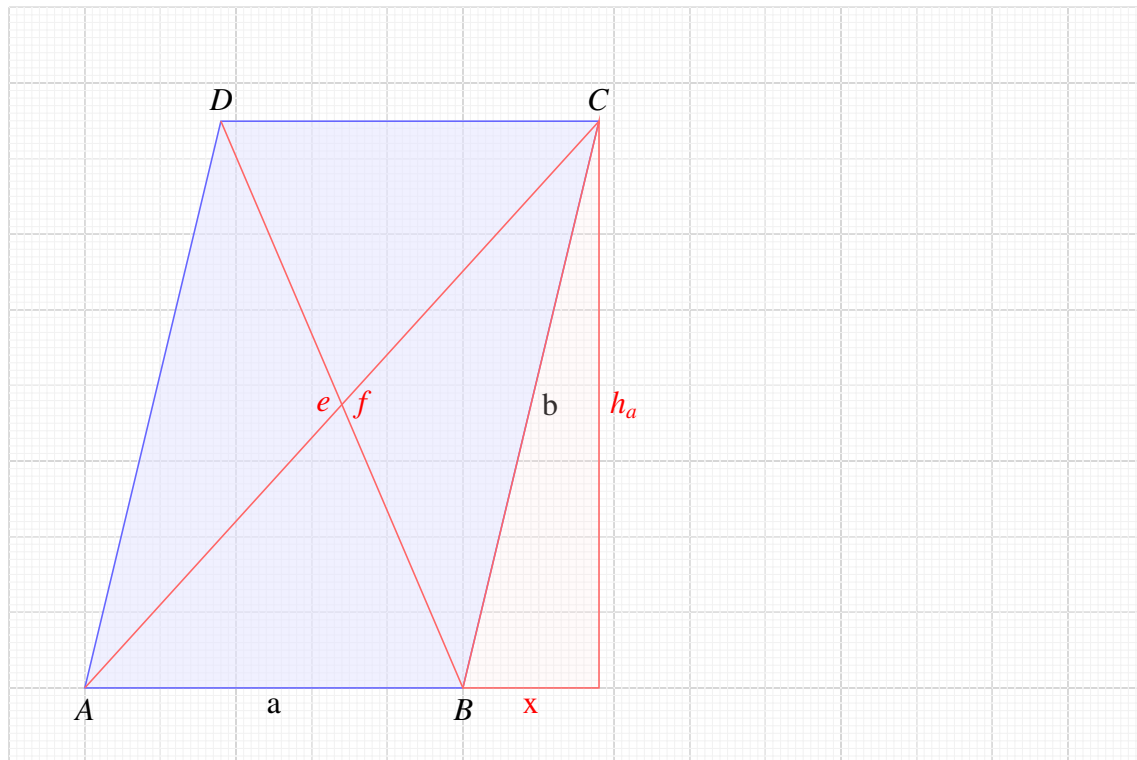
$$e^2 = h_a^2 + (a + x)^2 \Rightarrow e = \sqrt{h_a^2 + (a + x)^2}$$

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{63,5^2 + (45 + 29,4)^2} = \underline{97,8 \text{ mm}}$$

$$A = a \cdot h_a = 45 \cdot 63,5 = \underline{2858 \text{ mm}^2}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{2858}{70} = \underline{40,8 \text{ mm}}$$

19 $a = 50 \text{ mm}, b = 77 \text{ mm}, h_a = 74,9 \text{ mm}.$



$$A = a \cdot h_a = 50 \cdot 74,9 = \underline{3747 \text{ mm}^2}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{77^2 - 74,9^2} = 17,7 \text{ mm}$$

Phytagoras

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

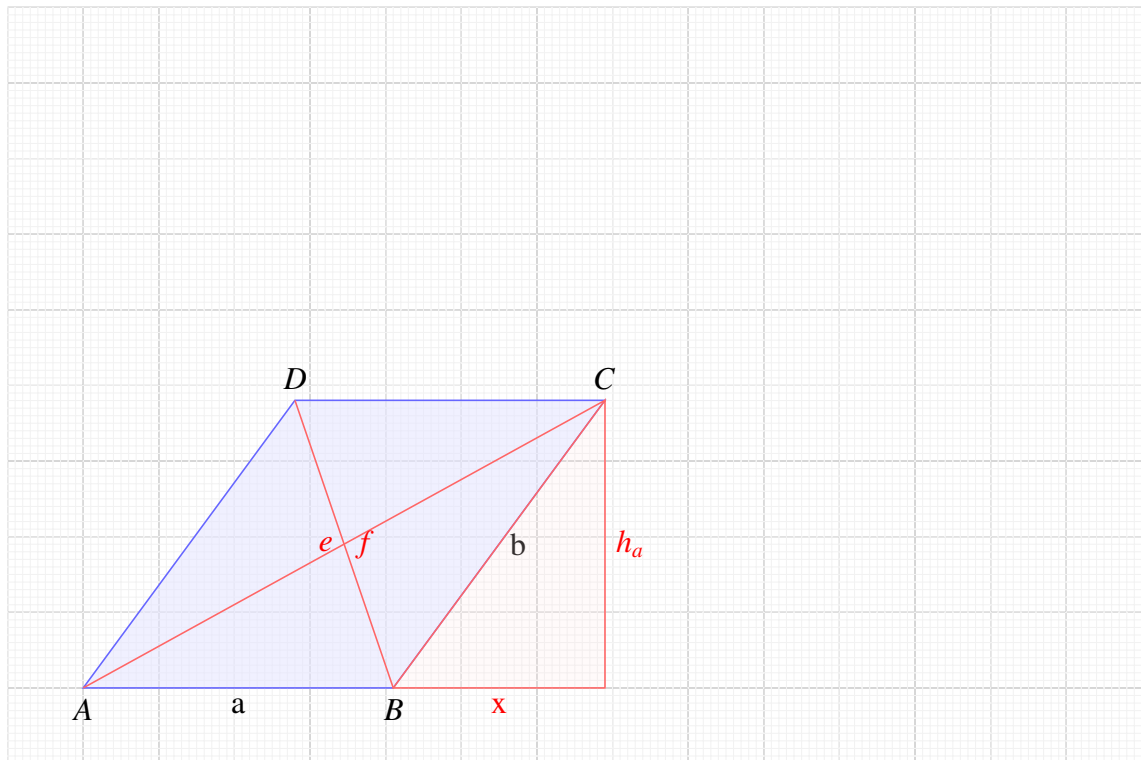
$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{74,9^2 + (50 + 17,7)^2} = \underline{101,0 \text{ mm}}$$

Phytagoras

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

$$f = \sqrt{h_a^2 + (a - x)^2} = \sqrt{74,9^2 + (50 - 17,7)^2} = \underline{81,6 \text{ mm}}$$

20 $a = 41 \text{ mm}, b = 47 \text{ mm}, A = 1559,2 \text{ mm}^2.$



$$A = a \cdot h_a \Rightarrow h_a = \frac{A}{a} = \frac{1559,2}{41} = \underline{38,0 \text{ mm}}$$

$$A = b \cdot h_b \Rightarrow h_b = \frac{A}{b} = \frac{1559,2}{47} = \underline{33,2 \text{ mm}}$$

Phytagoras

$$b^2 = h_a^2 + x^2 \Rightarrow x = \sqrt{b^2 - h_a^2} = \sqrt{47^2 - 38,0^2} = 27,6 \text{ mm}$$

Phytagoras

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

$$e = \sqrt{h_a^2 + (a + x)^2} = \sqrt{38,0^2 + (41 + 27,6)^2} = \underline{78,5 \text{ mm}}$$

Phytagoras

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

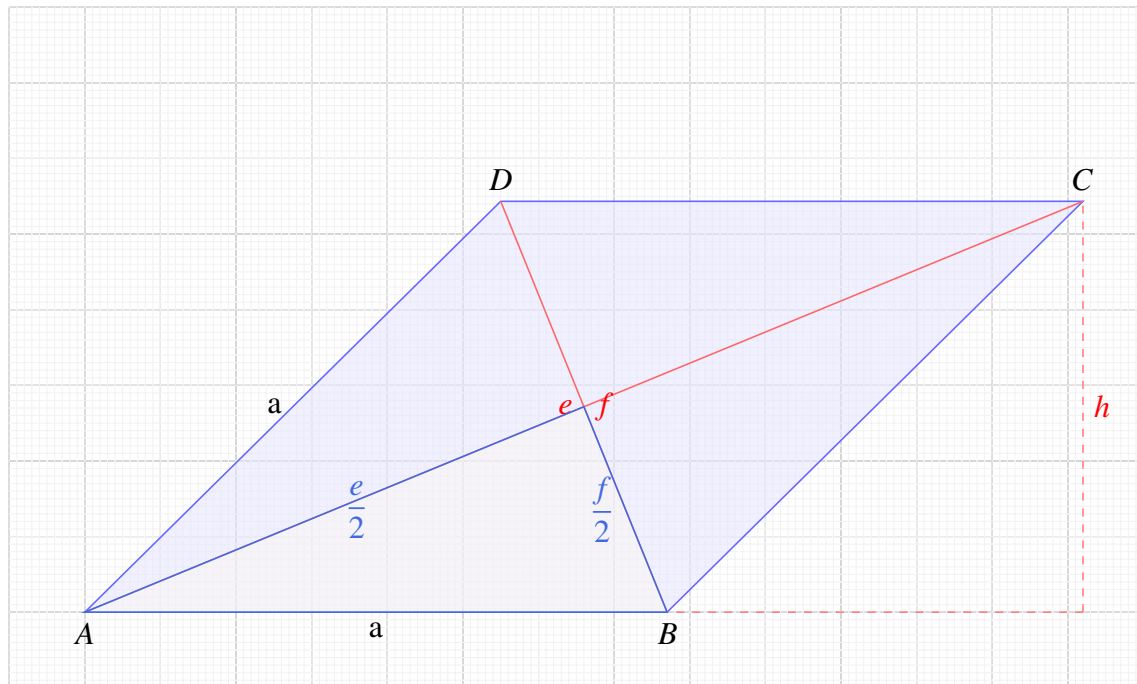
$$f = \sqrt{h_b^2 + (a - x)^2} = \sqrt{33,2^2 + (41 - 27,6)^2} = \underline{40,3 \text{ mm}}$$

2.1.3 Rhombus

Gegeben ist ein Rhombus mit nachfolgenden Daten. Die Werte für a , e , f , h , A und U sind zu vervollständigen und zu berechnen!

11:38 **3**
2014-01-17

21 $e = 142,3 \text{ mm}$, $f = 58,8 \text{ mm}$.



Phytgoras

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

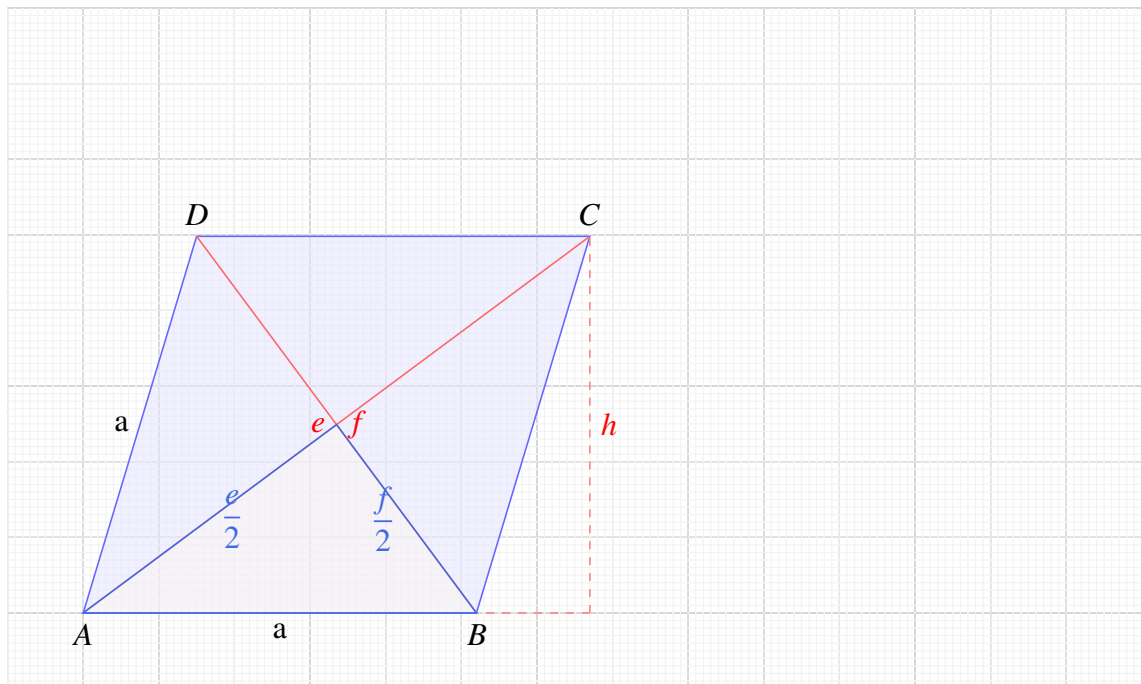
$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{142,3}{2}\right)^2 + \left(\frac{58,8}{2}\right)^2} = \underline{77 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{142,3 \cdot 58,8}{2} = \underline{4183,4 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{4183,4}{77} = \underline{54,3 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 77 = \underline{308 \text{ mm}}$$

22 $a = 52 \text{ mm}$, $e = 83,5 \text{ mm}$.



Phytagoras

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

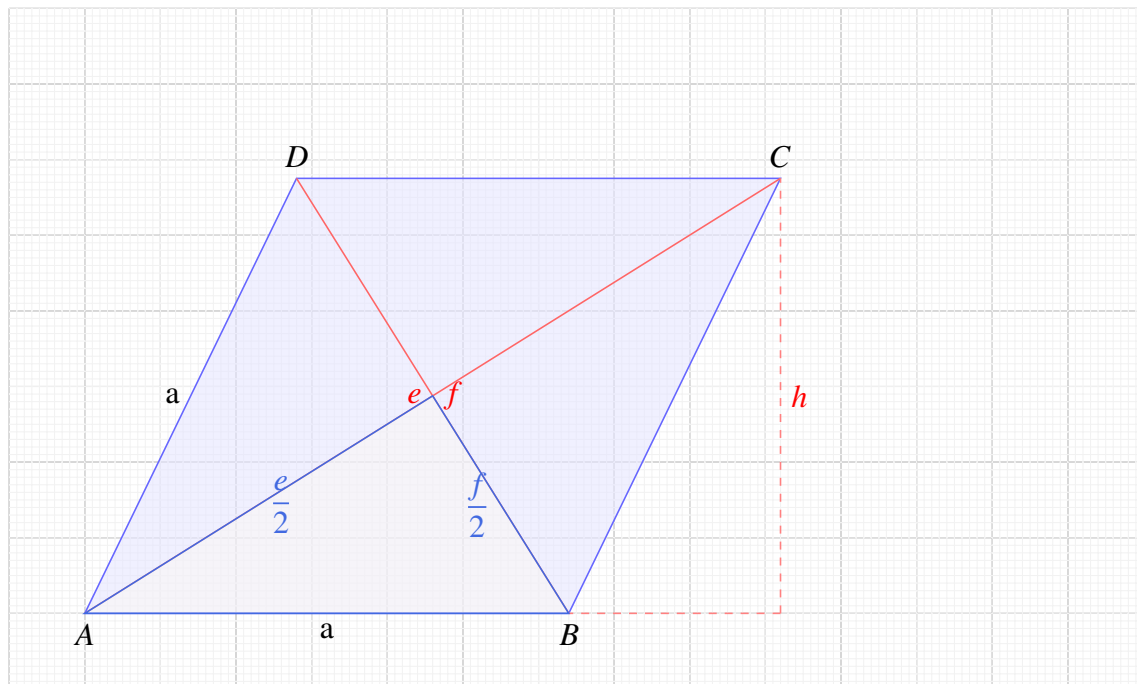
$$f = 2 \cdot \sqrt{a^2 - \left(\frac{e}{2}\right)^2} = 2 \cdot \sqrt{52^2 - \left(\frac{83,5}{2}\right)^2} = \underline{62,1 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{83,5 \cdot 62,1}{2} = \underline{2589,4 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2589,4}{52} = \underline{49,8 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 52 = \underline{208 \text{ mm}}$$

23 $a = 64 \text{ mm}, f = 67,8 \text{ mm}.$



Phytagoras

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

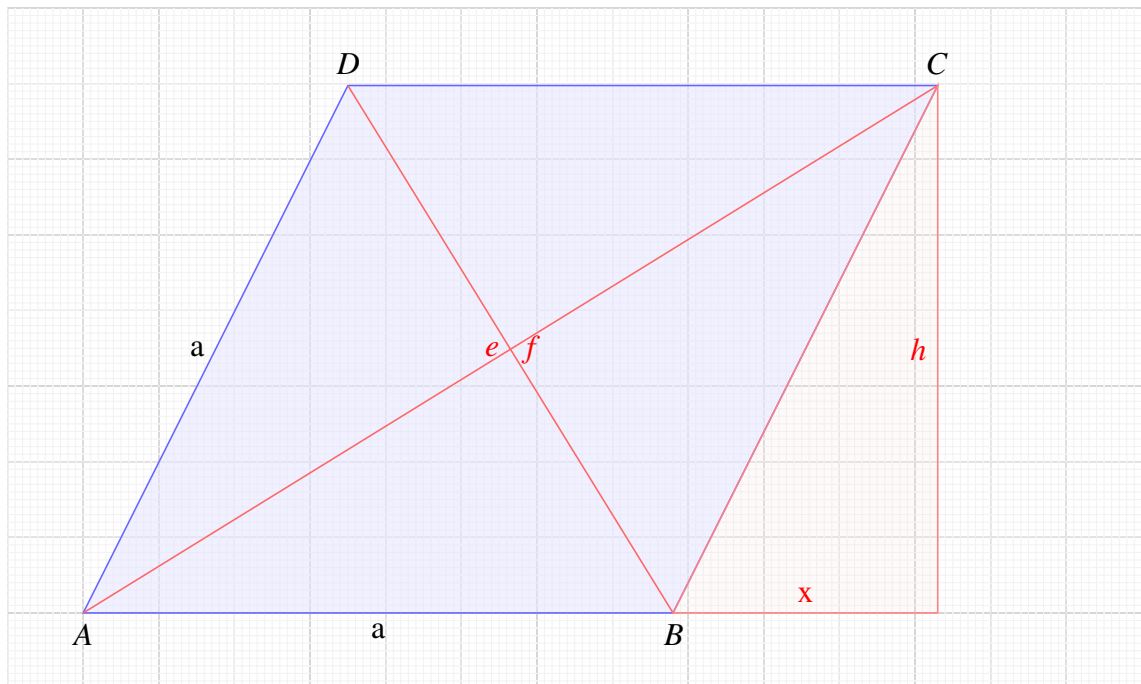
$$e = 2 \cdot \sqrt{a^2 - \left(\frac{f}{2}\right)^2} = 2 \cdot \sqrt{64^2 - \left(\frac{67,8}{2}\right)^2} = \underline{108,5 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{108,5 \cdot 67,8}{2} = \underline{3681,6 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{3681,6}{64} = \underline{57,5 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 4 = \underline{256 \text{ mm}}$$

24 $a = 78 \text{ mm}, h = 69,7 \text{ mm}.$



$$A = a \cdot h = 78 \cdot 69,7 = \underline{5439,4 \text{ mm}^2}$$

Phytagoras

$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{78^2 - 69,7^2} = 34,9 \text{ mm}$$

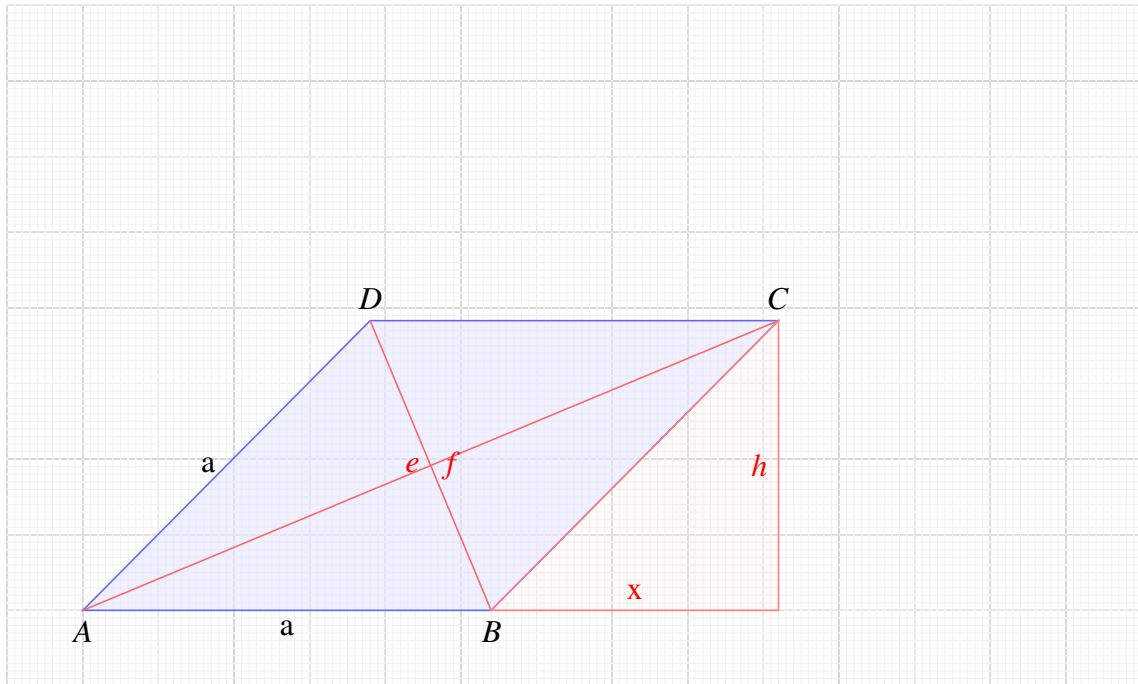
Phytagoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{69,7^2 + (78 + 34,9)^2} = \underline{132,7 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 5439,4}{132,7} = \underline{82,0 \text{ mm}}$$

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

25 $a = 54 \text{ mm}, A = 2068,6 \text{ mm}^2$.



$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2068,6}{54} = \underline{38,3 \text{ mm}}$$

Phytagoras

$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{54^2 - 38,3^2} = 38,1 \text{ mm}$$

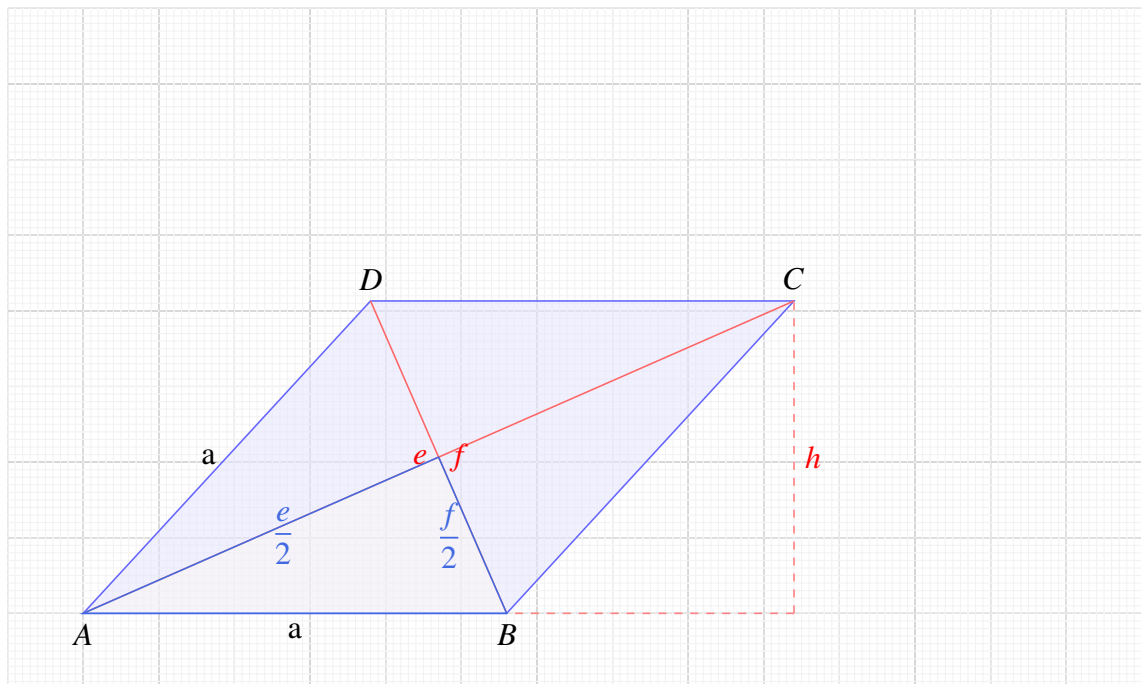
Phytagoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{38,3^2 + (54 + 38,1)^2} = \underline{99,7 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 2068,6}{99,7} = \underline{41,5 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 4 = \underline{216 \text{ mm}}$$

26 $e = 102,5 \text{ mm}$, $A = 2313,6 \text{ mm}^2$.



$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 2313,6}{102,5} = \underline{45,1 \text{ mm}}$$

Phytagoras

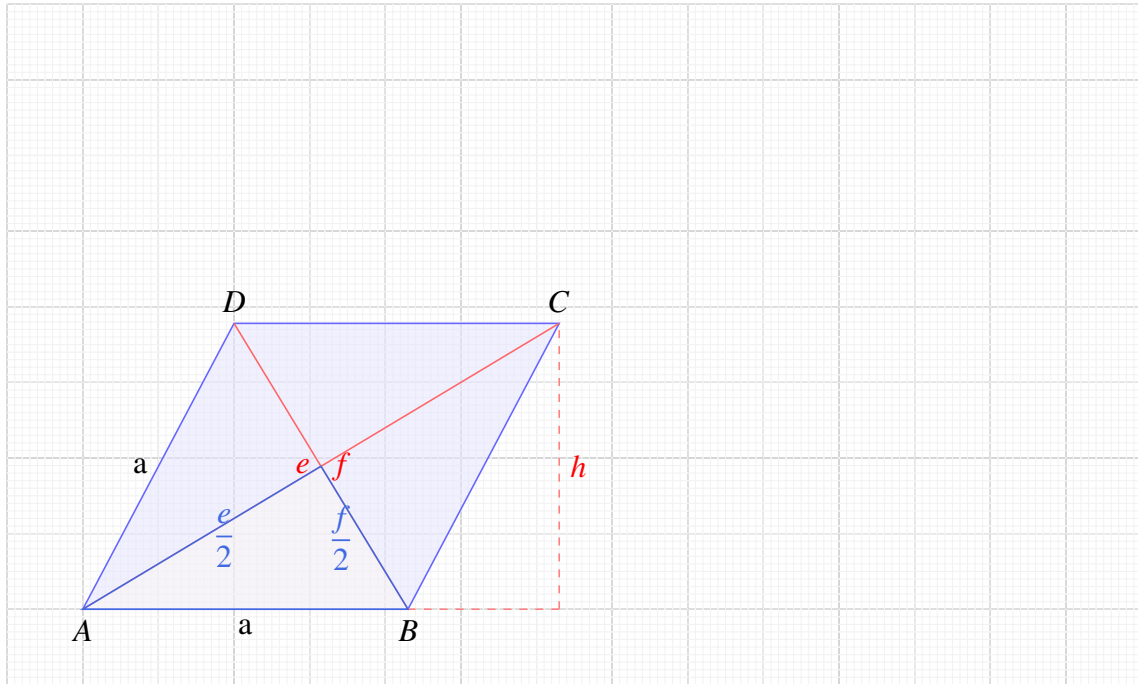
$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{102,5}{2}\right)^2 + \left(\frac{45,1}{2}\right)^2} = \underline{56 \text{ mm}}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2313,6}{56} = \underline{41,3 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 56 = \underline{224 \text{ mm}}$$

$$27 \quad e = 73,9 \text{ mm}, h = 37,8 \text{ mm}.$$



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

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

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

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

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

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

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

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

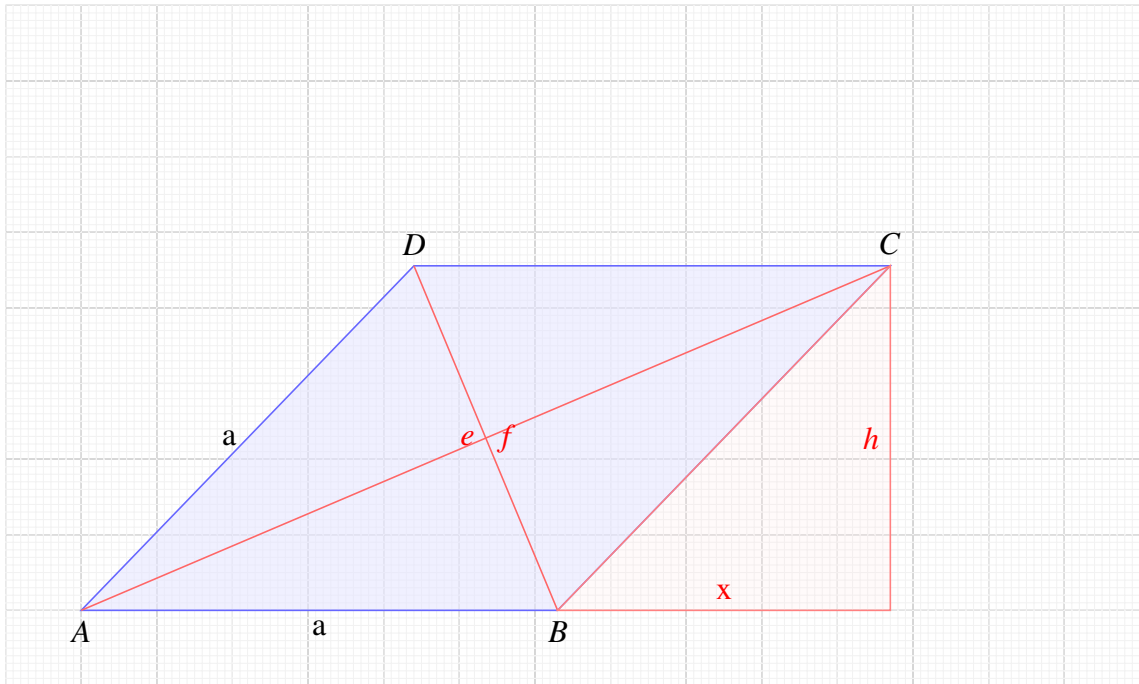
$$f = \sqrt{\frac{e^2 \cdot h^2}{e^2 - h^2}} = \frac{e \cdot h}{\sqrt{e^2 - h^2}} = \frac{73,9^2 \cdot 37,8^2}{\sqrt{73,9^2 - 37,8^2}} = \underline{44,0}$$

$$A = \frac{e \cdot f}{2} = \frac{73,9 \cdot 44,0}{2} = \underline{1625,4 \text{ mm}^2}$$

$$A = a \cdot h \quad \Rightarrow \quad a = \frac{A}{h} = \frac{1625,4}{37,8} = \underline{43 \text{ mm}}$$

$$U = 4 \cdot a = a \cdot 43 = \underline{172 \text{ mm}}$$

28 $A = 2870,4 \text{ mm}^2$, $U = 252 \text{ mm}$.



$$U = 4 \cdot a \Rightarrow a = \frac{U}{4} = \frac{252}{4} = \underline{63 \text{ mm}}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2870,4}{63} = \underline{45,6 \text{ mm}}$$

Phytagoras

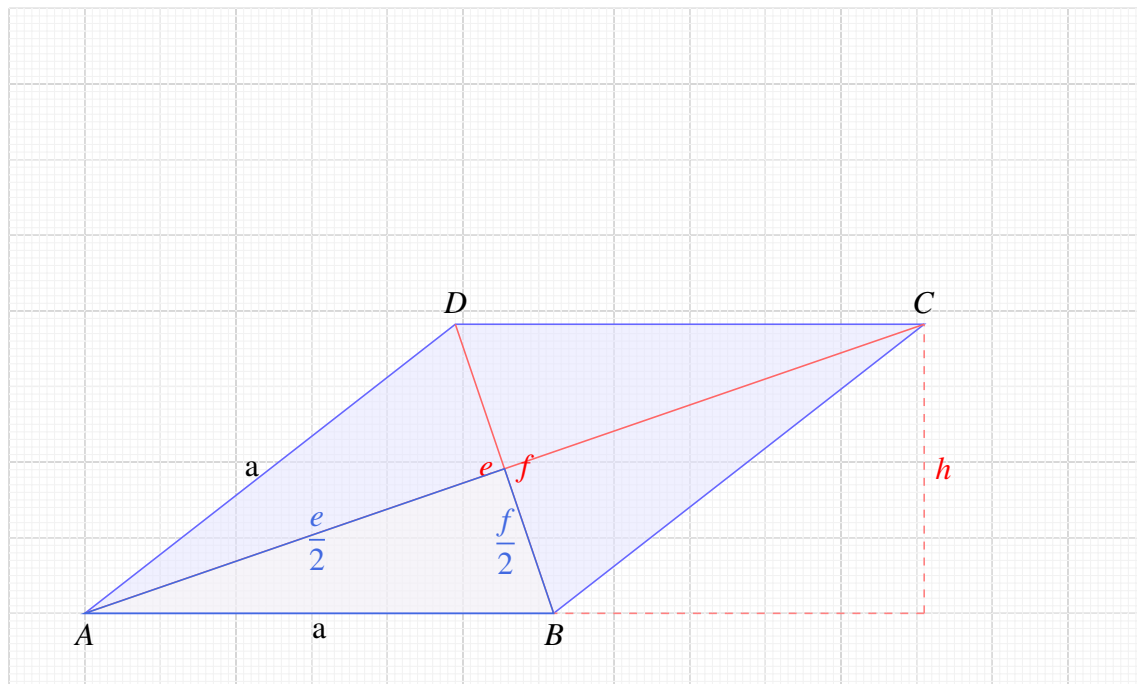
$$a^2 = h^2 + x^2 \Rightarrow x = \sqrt{a^2 - h^2} = \sqrt{63^2 - 45,6^2} = 43,5 \text{ mm}$$

Phytagoras

$$e^2 = h^2 + (a + x)^2 \Rightarrow e = \sqrt{h^2 + (a + x)^2} = \sqrt{45,6^2 + (63 + 43,5)^2} = \underline{115,8 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} \Rightarrow f = \frac{2 \cdot A}{e} = \frac{2 \cdot 2870,4}{115,8} = \underline{49,6 \text{ mm}}$$

29 $e = 117,2 \text{ mm}, f = 40,4 \text{ mm}.$



Phytagoras

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

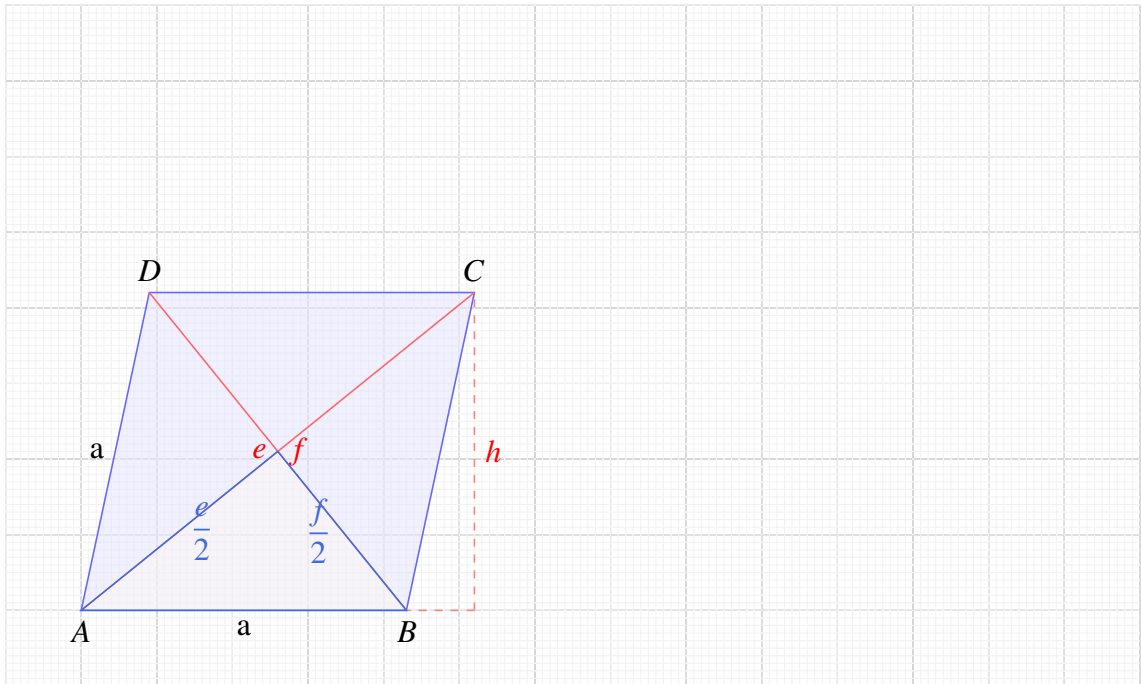
$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{\left(\frac{117,2}{2}\right)^2 + \left(\frac{40,4}{2}\right)^2} = \underline{62 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{117,2 \cdot 40,4}{2} = \underline{2370,4 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{2370,4}{62} = \underline{38,2 \text{ mm}}$$

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

30 $a = 43 \text{ mm}$, $e = 66,9 \text{ mm}$.



Phytagoras

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

$$f = 2 \cdot \sqrt{a^2 - \left(\frac{e}{2}\right)^2} = 2 \cdot \sqrt{43^2 - \left(\frac{66,9}{2}\right)^2} = \underline{54,0 \text{ mm}}$$

$$A = \frac{e \cdot f}{2} = \frac{66,9 \cdot 54,0}{2} = \underline{1807,4 \text{ mm}^2}$$

$$A = a \cdot h \Rightarrow h = \frac{A}{a} = \frac{1807,4}{43} = \underline{42,0 \text{ mm}}$$

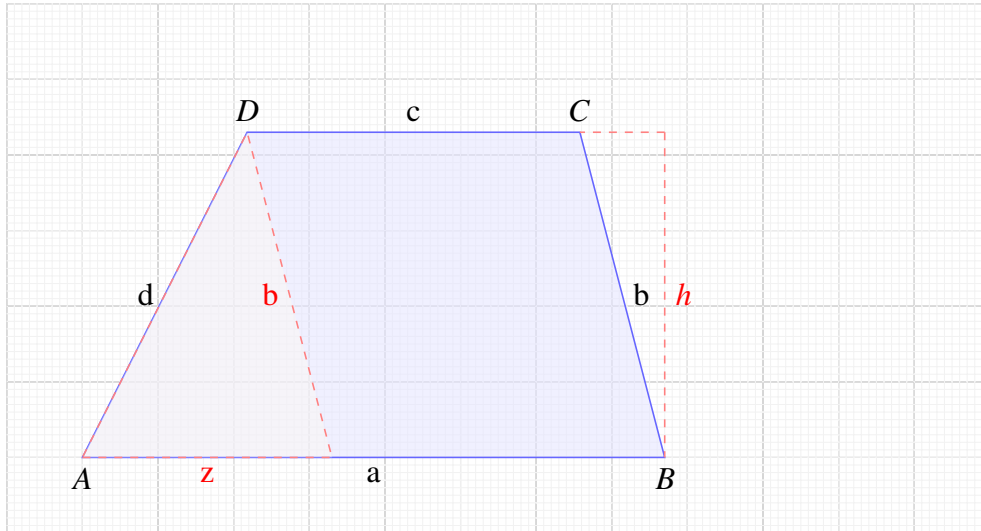
$$U = 4 \cdot a = a \cdot 43 = \underline{172 \text{ mm}}$$

2.1.4 Allgemeines Trapez

Gegeben ist ein Trapez mit nachfolgenden Daten. Die Werte für a, b, c, d, e, f, h, A und U sind zu vervollständigen und zu berechnen!

11:38 **4**
2014-01-17

31 $a = 77 \text{ mm}, b = 44,4 \text{ mm}, c = 44 \text{ mm}, d = 48,2 \text{ mm}.$



Heronsche Flächenformel

$$z = a - c = 77 - 44 = 33 \text{ mm}$$

$$s = \frac{b + d + z}{2} = \frac{44,4 + 48,2 + 33}{2} = 97,6$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - d) \cdot (s - z)} = \sqrt{97,6 \cdot 20,6 \cdot 49,4 \cdot 27,6} = 1655,5 \text{ mm}^2$$

$$A_{\Delta} = \frac{z \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{z} = \frac{2 \cdot 1655,5}{33} = \underline{43,0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{77 + 44}{2} \cdot 43,0 = \underline{2601,5 \text{ mm}^2}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{48,2^2 - 43,0^2} = 21,8 \text{ mm}$$

Phytgoras

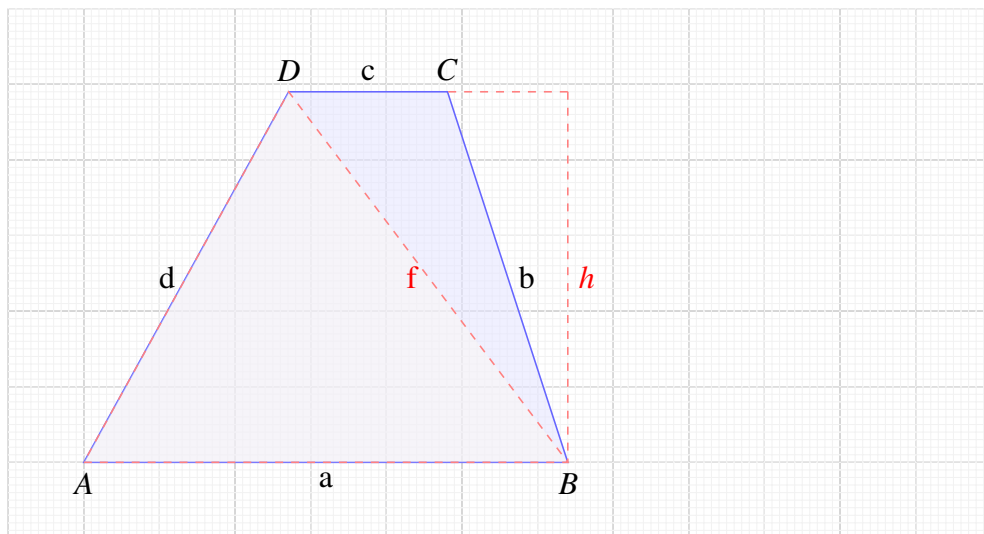
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{43,0^2 + (44 + 21,8)^2} = \underline{78,6 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 77 - 21,8 - 44 = 11,2 \text{ mm}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{43,0^2 + (44 + 11,2)^2} = \underline{70,0 \text{ mm}}$$

32 $a = 64 \text{ mm}, b = 51,5 \text{ mm}, d = 56,0 \text{ mm}, f = 61,3 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{64 + 56,0 + 61,3}{2} = 90,7 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{90,7 \cdot 26,7 \cdot 34,7 \cdot 29,3} = 1568,1 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1568,1}{64} = \underline{49,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{56,0^2 - 49,0^2} = 27,1 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{51,5^2 - 49,0^2} = 15,9 \text{ mm}$$

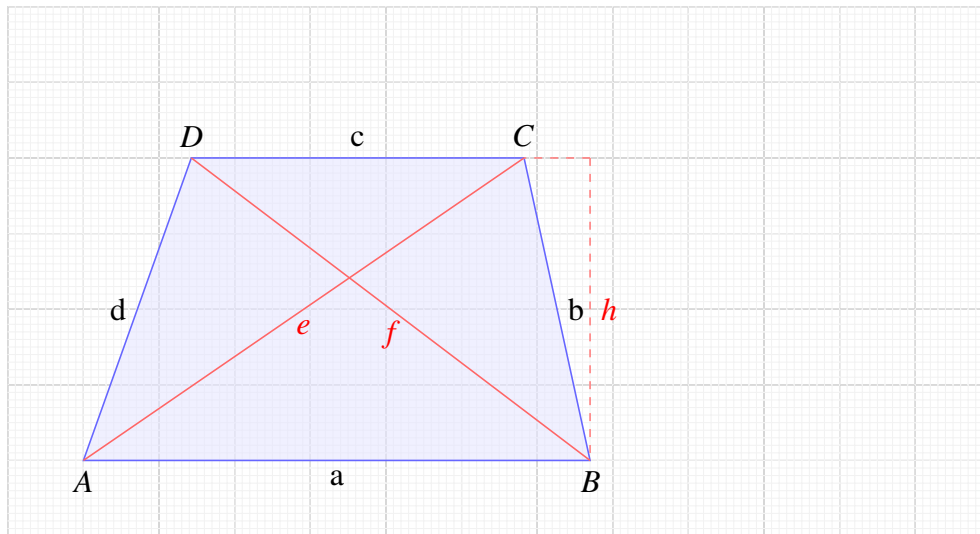
Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{49,0^2 + (21 + 27,1)^2} = \underline{68,7 \text{ mm}}$$

$$c = a - x - y = 64 - 27,1 - 15,9 = \underline{21 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{64 + 21}{2} \cdot 49,0 = \underline{2082,6 \text{ mm}^2}$$

33 $a = 67 \text{ mm}, c = 44 \text{ mm}, d = 42,5 \text{ mm}, f = 66,2 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{67 + 42,5 + 66,2}{2} = 78,6 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{78,6 \cdot 34,6 \cdot 36,1 \cdot 7,9} = 880,0 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 880,0}{67} = \underline{40,0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{42,5^2 - 40,0^2} = 14,3 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 67 - 14,3 - 44 = 8,7 \text{ mm}$$

Phytagoras

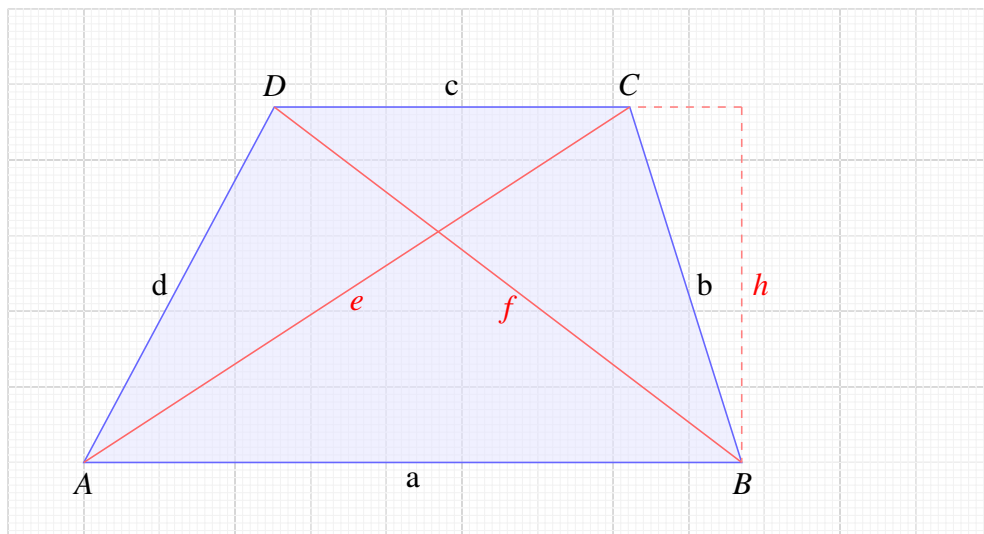
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{40,0^2 + 8,7^2} = \underline{40,9 \text{ mm}}$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{40,0^2 + (44 + 14,3)^2} = \underline{70,7 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{67 + 44}{2} \cdot 40,0 = \underline{2220,0 \text{ mm}^2}$$

34 $a = 87 \text{ mm}$, $c = 47 \text{ mm}$, $d = 53,3 \text{ mm}$, $e = 86,1 \text{ mm}$.



Heronsche Flächenformel

$$s = \frac{c + d + e}{2} = \frac{47 + 53,3 + 86,1}{2} = 109,0 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - c) \cdot (s - d) \cdot (s - e)} = \sqrt{109,0 \cdot 22,0 \cdot 55,7 \cdot 31,3} = 2044,7 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 2044,7}{47} = \underline{47,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{53,3^2 - 47,0^2} = 25,2 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 87 - 25,2 - 47 = 14,8 \text{ mm}$$

Phytgoras

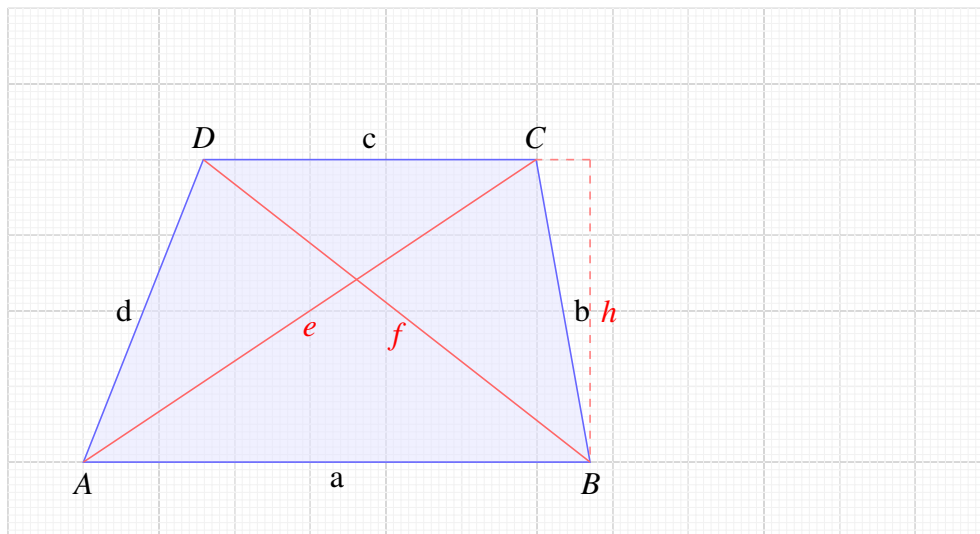
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{47,0^2 + 14,8^2} = \underline{49,3 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{47,0^2 + (47 + 14,8)^2} = \underline{77,6 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{87 + 47}{2} \cdot 47,0 = \underline{3149,2 \text{ mm}^2}$$

35 $a = 67 \text{ mm}, c = 44 \text{ mm}, f = 64,9 \text{ mm}, A = 2219,9 \text{ mm}^2$.



$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2219,9}{67+44} = \underline{40,0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c+y)^2 \Rightarrow y = \sqrt{f^2 - h^2} - c = \sqrt{64,9^2 - 40,0^2} - 44 = 7,1 \text{ mm}$$

$$c = a - x - y \Rightarrow x = a - y - c = 67 - 7,1 - 44 = 15,9 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{40,0^2 + 7,1^2} = \underline{40,6 \text{ mm}}$$

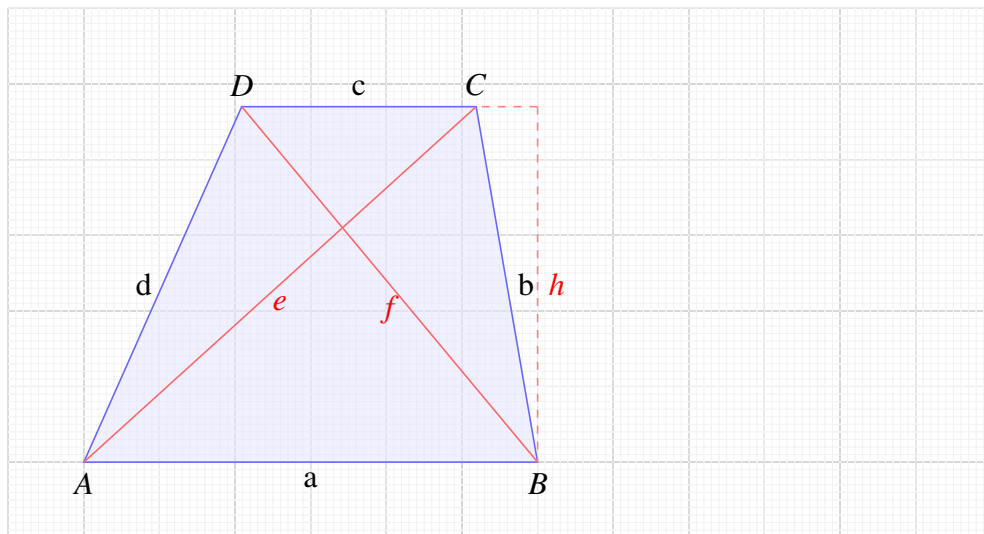
Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow d = \sqrt{h^2 + x^2} = \sqrt{40,0^2 + 15,9^2} = \underline{43,0 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c+x)^2 \Rightarrow e = \sqrt{h^2 + (c+x)^2} = \sqrt{40,0^2 + (44 + 15,9)^2} = \underline{72,0 \text{ mm}}$$

36 $a = 60 \text{ mm}, c = 31 \text{ mm}, d = 51,4 \text{ mm}, h = 47,0 \text{ mm}.$



Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{51,4^2 - 47,0^2} = 20,9 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 60 - 20,9 - 31 = 8,1 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{47,0^2 + 8,1^2} = \underline{47,7 \text{ mm}}$$

Phytgoras

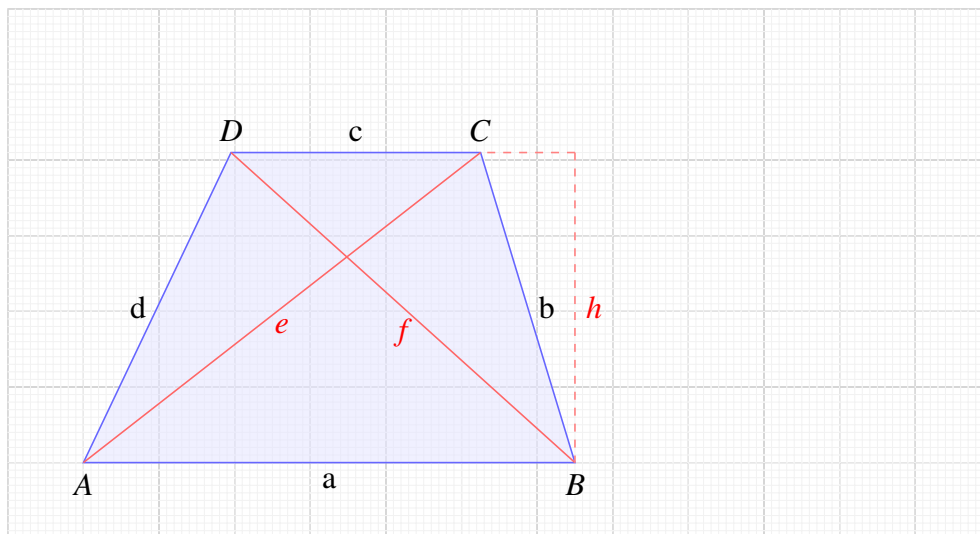
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{47,0^2 + (31 + 20,9)^2} = \underline{70,0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{47,0^2 + (31 + 8,1)^2} = \underline{61,2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{60 + 31}{2} \cdot 47,0 = \underline{2138,6 \text{ mm}^2}$$

37 $b = 42,9 \text{ mm}, c = 33 \text{ mm}, d = 45,4 \text{ mm}, f = 61,2 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{b + c + f}{2} = \frac{42,9 + 33 + 61,2}{2} = 85,8 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - c) \cdot (s - f)} = \sqrt{85,8 \cdot 20,8 \cdot 40,4 \cdot 24,6} = 1332,6 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 1332,6}{33} = \underline{41,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{45,4^2 - 41,0^2} = 19,5 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{42,9^2 - 41,0^2} = 12,5 \text{ mm}$$

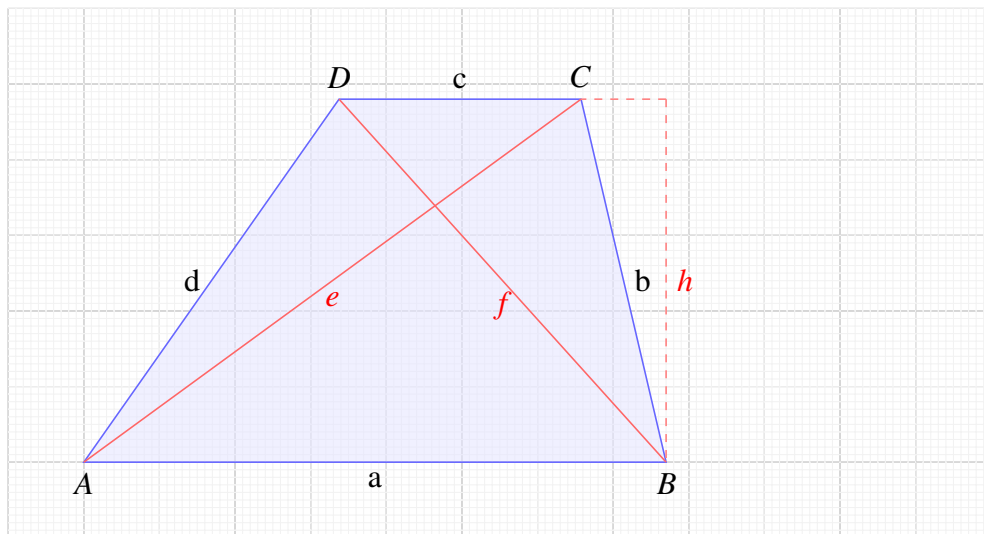
$$a = c + x + y = 33 + 19,5 + 12,5 = \underline{65 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{41,0^2 + (33 + 19,5)^2} = \underline{66,6 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{65 + 33}{2} \cdot 41,0 = \underline{2009,1 \text{ mm}^2}$$

38 $a = 77 \text{ mm}, d = 58,7 \text{ mm}, f = 64,6 \text{ mm}, A = 2616,0 \text{ mm}^2.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{77 + 58,7 + 64,6}{2} = 100,1 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{100,1 \cdot 23,1 \cdot 41,5 \cdot 35,5} = 1848,0 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1848,0}{77} = \underline{48,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{58,7^2 - 48,0^2} = 33,8 \text{ mm}$$

$$A = \frac{a + c}{2} \cdot h \Rightarrow c = \frac{2 \cdot A}{h} - a = \frac{2 \cdot 2616,0}{48,0} - 77 = \underline{32 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 77 - 33,8 - 32 = 11,2 \text{ mm}$$

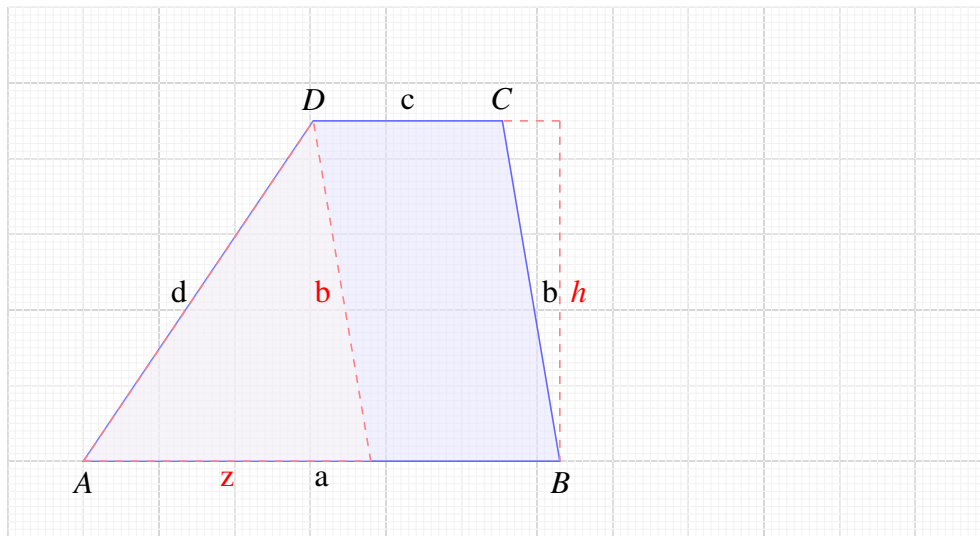
Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{48,0^2 + 11,2^2} = \underline{49,3 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{48,0^2 + (32 + 33,8)^2} = \underline{81,4 \text{ mm}}$$

39 $a = 63 \text{ mm}$, $b = 45,6 \text{ mm}$, $c = 25 \text{ mm}$, $d = 54,3 \text{ mm}$.



Heronsche Flächenformel

$$z = a - c = 63 - 25 = 38 \text{ mm}$$

$$s = \frac{b + d + z}{2} = \frac{45,6 + 54,3 + 38}{2} = 86,4$$

$$A_{\Delta} = \sqrt{s \cdot (s - b) \cdot (s - d) \cdot (s - z)} = \sqrt{86,4 \cdot 23,4 \cdot 32,1 \cdot 30,9} = 1417,6 \text{ mm}^2$$

$$A_{\Delta} = \frac{z \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{z} = \frac{2 \cdot 1417,6}{38} = \underline{45,0 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{63 + 25}{2} \cdot 45,0 = \underline{1980,1 \text{ mm}^2}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{54,3^2 - 45,0^2} = 30,4 \text{ mm}$$

Phytgoras

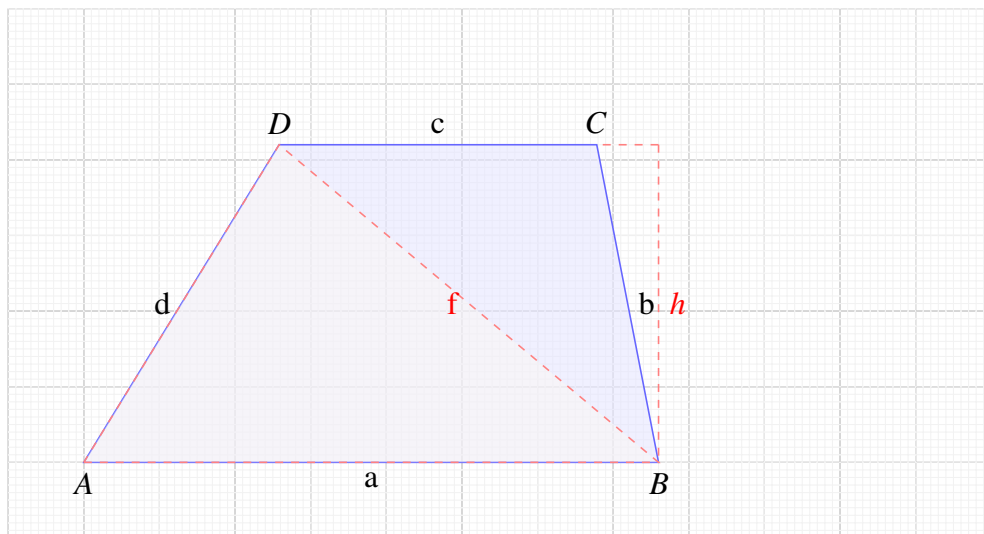
$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{45,0^2 + (25 + 30,4)^2} = \underline{71,4 \text{ mm}}$$

$$c = a - x - y \Rightarrow y = a - x - c = 63 - 30,4 - 25 = 7,6 \text{ mm}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{45,0^2 + (25 + 7,6)^2} = \underline{55,6 \text{ mm}}$$

40 $a = 76 \text{ mm}, b = 42,8 \text{ mm}, d = 49,3 \text{ mm}, f = 65,4 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{76 + 49,3 + 65,4}{2} = 95,4 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{95,4 \cdot 19,4 \cdot 46,1 \cdot 29,9} = 1596,1 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 1596,1}{76} = \underline{42,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{49,3^2 - 42,0^2} = 25,8 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow y = \sqrt{b^2 - h^2} = \sqrt{42,8^2 - 42,0^2} = 8,2 \text{ mm}$$

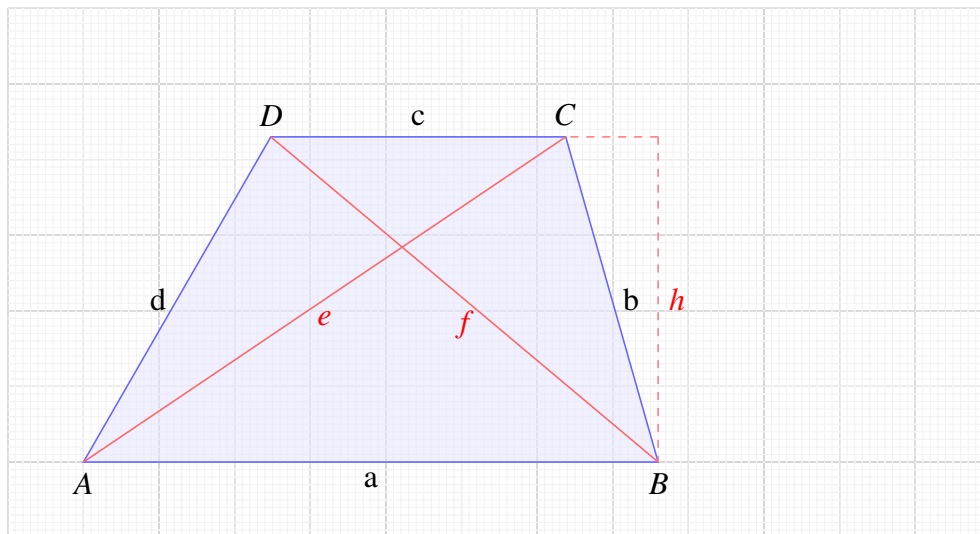
Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{42,0^2 + (42 + 25,8)^2} = \underline{79,8 \text{ mm}}$$

$$c = a - x - y = 76 - 25,8 - 8,2 = \underline{42 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{76 + 42}{2} \cdot 42,0 = \underline{2478,2 \text{ mm}^2}$$

41 $a = 76 \text{ mm}, c = 39 \text{ mm}, d = 49,6 \text{ mm}, f = 66,9 \text{ mm}.$



Heronsche Flächenformel

$$s = \frac{a + d + f}{2} = \frac{76 + 49,6 + 66,9}{2} = 82,8 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - a) \cdot (s - d) \cdot (s - f)} = \sqrt{82,8 \cdot 43,8 \cdot 33,1 \cdot 5,9} = 838,6 \text{ mm}^2$$

$$A_{\Delta} = \frac{a \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{a} = \frac{2 \cdot 838,6}{76} = \underline{43,0 \text{ mm}}$$

Phytagoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{49,6^2 - 43,0^2} = 24,8 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 76 - 24,8 - 39 = 12,2 \text{ mm}$$

Phytagoras

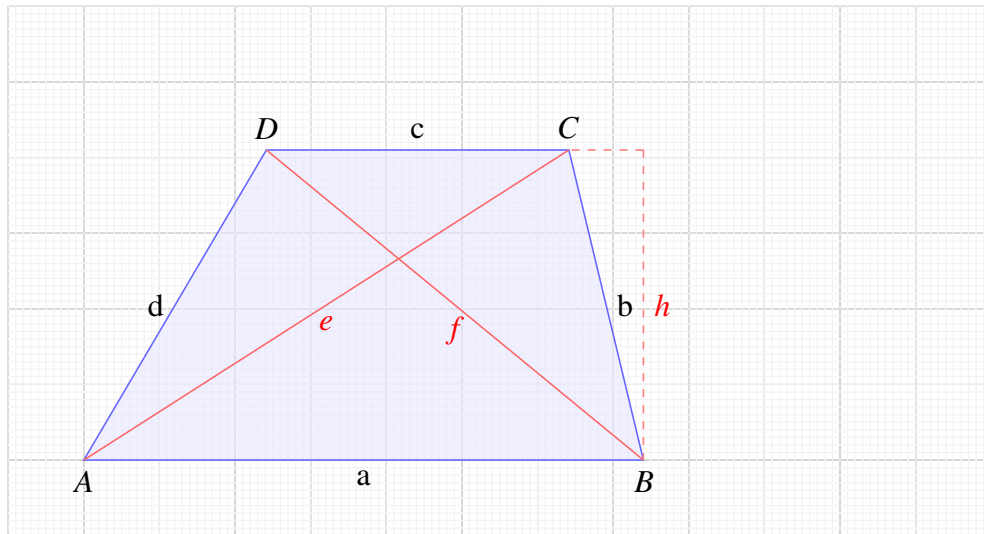
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{43,0^2 + 12,2^2} = \underline{44,7 \text{ mm}}$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{43,0^2 + (39 + 24,8)^2} = \underline{76,9 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{76 + 39}{2} \cdot 43,0 = \underline{2472,4 \text{ mm}^2}$$

42 $a = 74 \text{ mm}$, $c = 40 \text{ mm}$, $d = 47,6 \text{ mm}$, $e = 76,1 \text{ mm}$.



Heronsche Flächenformel

$$s = \frac{c + d + e}{2} = \frac{40 + 47,6 + 76,1}{2} = 93,1 \text{ mm}$$

$$A_{\Delta} = \sqrt{s \cdot (s - c) \cdot (s - d) \cdot (s - e)} = \sqrt{93,1 \cdot 19,1 \cdot 45,5 \cdot 28,5} = 1517,0 \text{ mm}^2$$

$$A_{\Delta} = \frac{c \cdot h}{2} \Rightarrow h = \frac{2 \cdot A_{\Delta}}{c} = \frac{2 \cdot 1517,0}{40} = \underline{41,0 \text{ mm}}$$

Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{47,6^2 - 41,0^2} = 24,1 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 74 - 24,1 - 40 = 9,9 \text{ mm}$$

Phytgoras

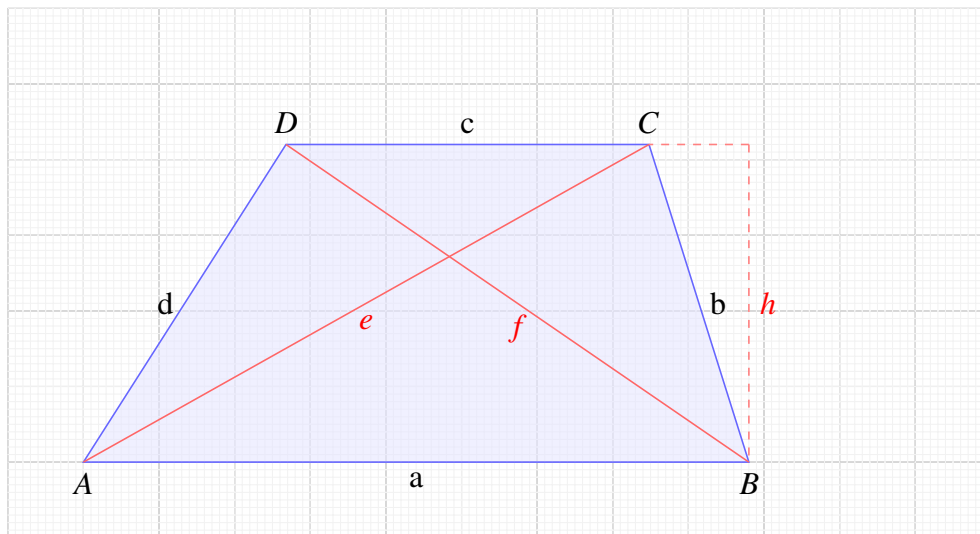
$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{41,0^2 + 9,9^2} = \underline{42,2 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{41,0^2 + (40 + 9,9)^2} = \underline{64,6 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{74 + 40}{2} \cdot 41,0 = \underline{2337,1 \text{ mm}^2}$$

43 $a = 88 \text{ mm}, c = 48 \text{ mm}, f = 74,2 \text{ mm}, A = 2856,2 \text{ mm}^2$.



$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2856,2}{88+48} = \underline{42,0 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c+y)^2 \Rightarrow y = \sqrt{f^2 - h^2} - c = \sqrt{74,2^2 - 42,0^2} - 48 = 13,2 \text{ mm}$$

$$c = a - x - y \Rightarrow x = a - y - c = 88 - 13,2 - 48 = 26,8 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{42,0^2 + 13,2^2} = \underline{44,0 \text{ mm}}$$

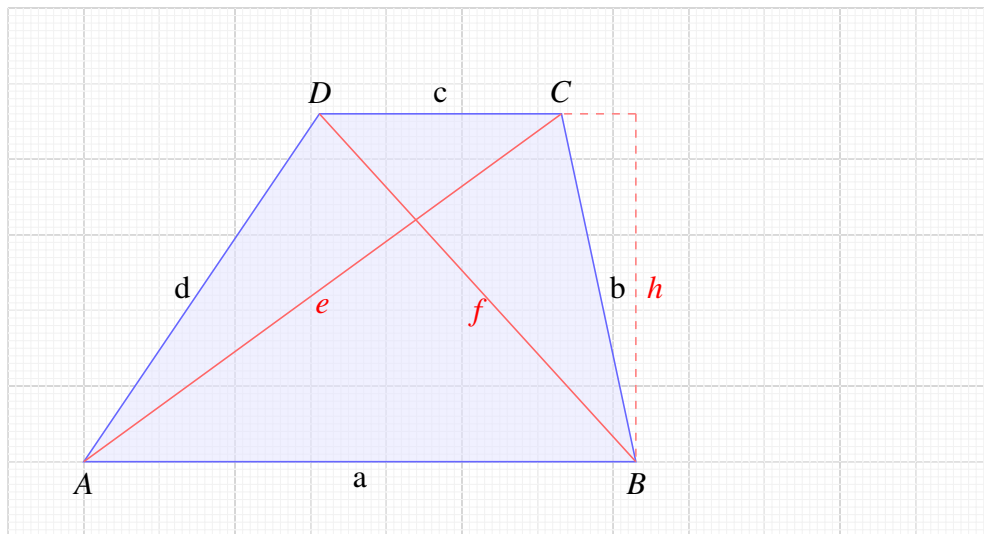
Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow d = \sqrt{h^2 + x^2} = \sqrt{42,0^2 + 26,8^2} = \underline{49,8 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c+x)^2 \Rightarrow e = \sqrt{h^2 + (c+x)^2} = \sqrt{42,0^2 + (48+26,8)^2} = \underline{85,8 \text{ mm}}$$

44 $a = 73 \text{ mm}, c = 32 \text{ mm}, d = 55,6 \text{ mm}, h = 46,0 \text{ mm}.$



Phytgoras

$$d^2 = h^2 + x^2 \Rightarrow x = \sqrt{d^2 - h^2} = \sqrt{55,6^2 - 46,0^2} = 31,2 \text{ mm}$$

$$c = a - x - y \Rightarrow y = a - x - c = 73 - 31,2 - 32 = 9,8 \text{ mm}$$

Phytgoras

$$b^2 = h^2 + y^2 \Rightarrow b = \sqrt{h^2 + y^2} = \sqrt{46,0^2 + 9,8^2} = \underline{47,0 \text{ mm}}$$

Phytgoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow e = \sqrt{h^2 + (c + x)^2} = \sqrt{46,0^2 + (32 + 31,2)^2} = \underline{78,1 \text{ mm}}$$

Phytgoras

$$f^2 = h^2 + (c + y)^2 \Rightarrow f = \sqrt{h^2 + (c + y)^2} = \sqrt{46,0^2 + (32 + 9,8)^2} = \underline{62,2 \text{ mm}}$$

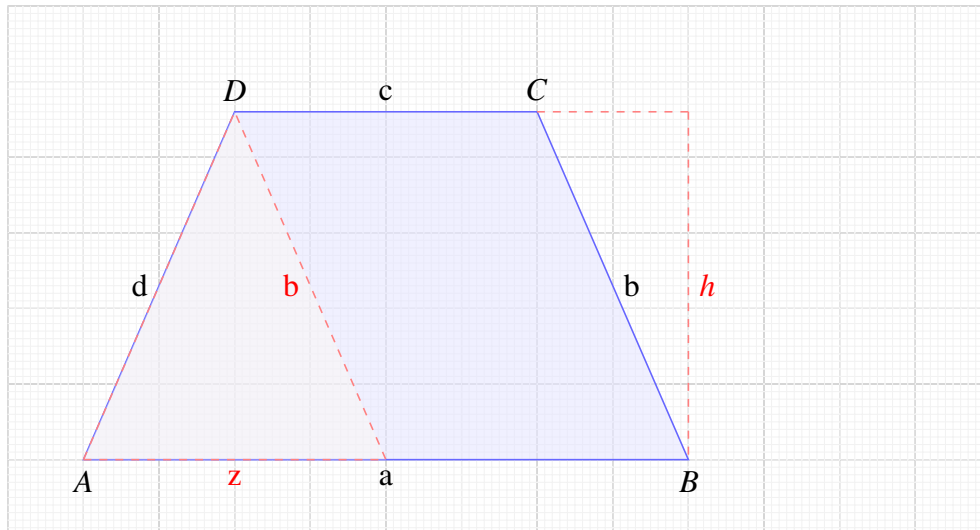
$$A = \frac{a + c}{2} \cdot h = \frac{73 + 32}{2} \cdot 46,0 = \underline{2415,0 \text{ mm}^2}$$

2.1.5 Gleichschenkeliges Trapez

Gegeben ist ein gleichschenkeliges Trapez ($b = d$) mit nachfolgenden Daten. Die Werte für a , b , c , e , h , A und U sind zu vervollständigen und zu berechnen!

11:38 **5**
2014-01-17

45 $a = 80 \text{ mm}$, $b = 50,2 \text{ mm}$, $h = 46,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{50,2^2 - 46,0^2} = 20,0 \text{ mm}$$

$$c = a - 2 \cdot x = 80 - 2 \cdot 20,0 = \underline{40 \text{ mm}}$$

Phytagoras

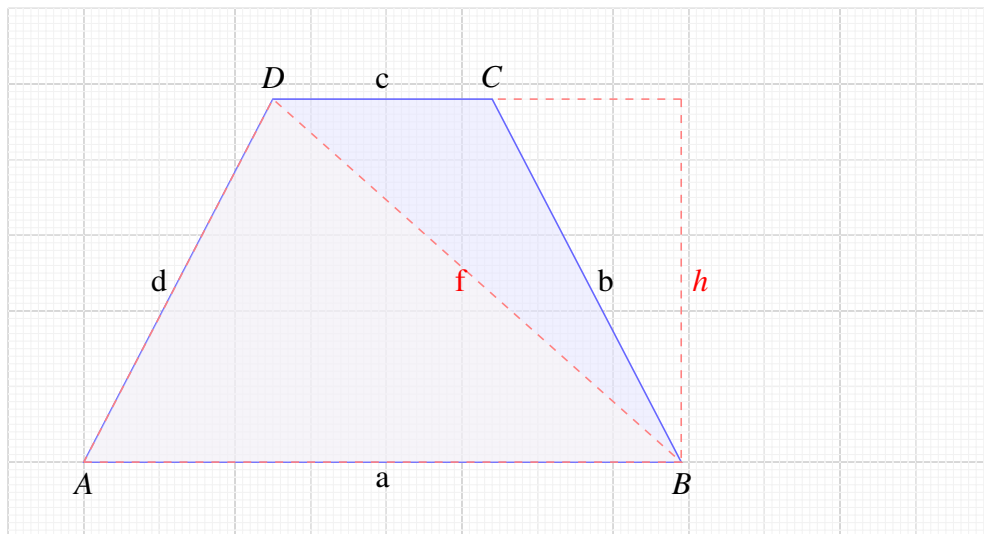
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{46,0^2 + (40 + 20,0)^2} = \underline{75,6 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{80 + 40}{2} \cdot 46,0 = \underline{2760,0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 80 + 40 + 2 \cdot 50,2 = \underline{220,3 \text{ mm}}$$

46 $a = 79 \text{ mm}$, $b = 54,1 \text{ mm}$, $c = 29 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{79 - 29}{2} = 25,0 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{54,1^2 - 25,0^2} = \underline{48,0 \text{ mm}}$$

Phytagoras

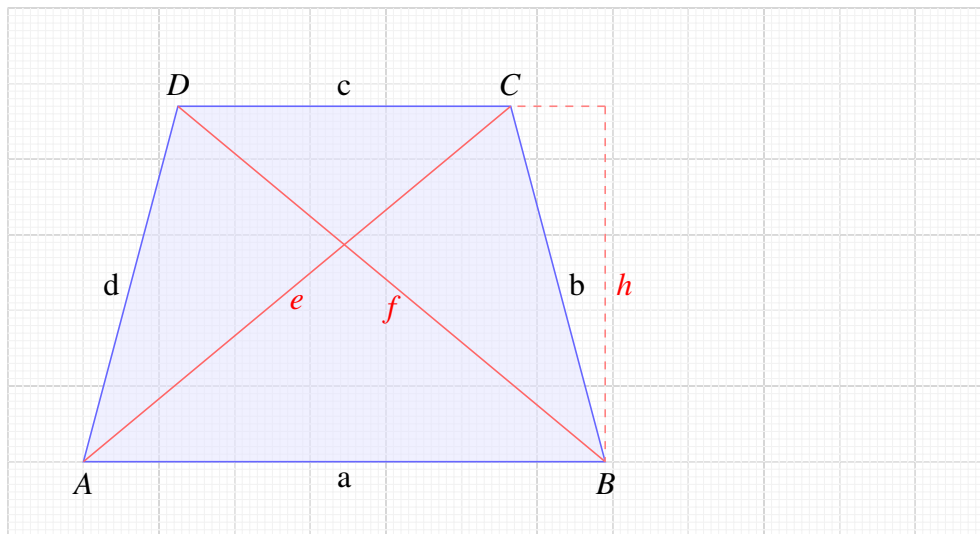
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{48,0^2 + (29 + 25,0)^2} = \underline{72,2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{79 + 29}{2} \cdot 48,0 = \underline{2592,0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 79 + 29 + 2 \cdot 54,1 = \underline{216,2 \text{ mm}}$$

47 $a = 69 \text{ mm}$, $b = 48,6 \text{ mm}$, $U = 210,3 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

$$U = a + c + 2 \cdot b \Rightarrow c = U - a - 2 \cdot b = 210,3 - 69 - 2 \cdot 48,6 = \underline{44 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{69 - 44}{2} = 12,5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{48,6^2 - 12,5^2} = \underline{47,0 \text{ mm}}$$

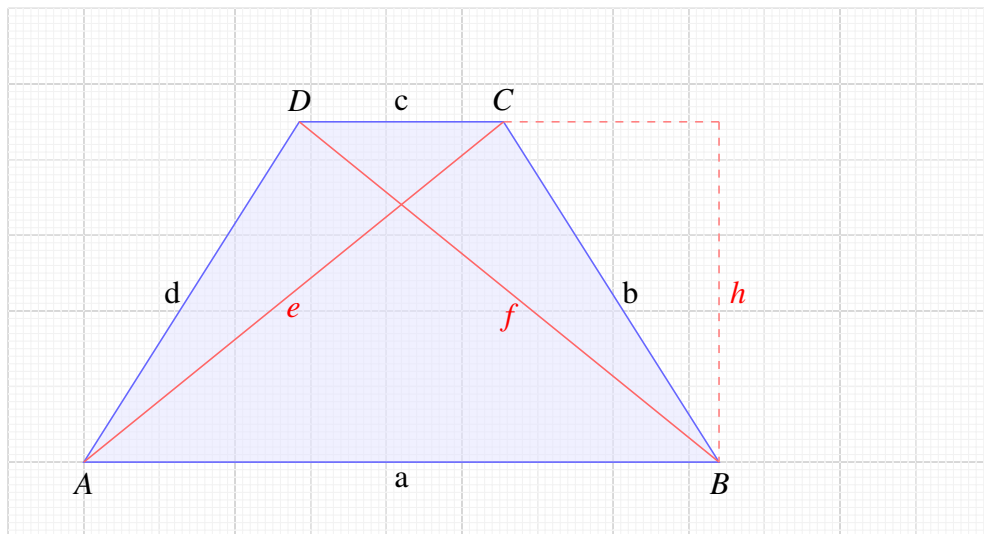
Phytagoras

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

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{47,0^2 + (44 + 12,5)^2} = \underline{73,5 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{69 + 44}{2} \cdot 47,0 = \underline{2655,3 \text{ mm}^2}$$

48 $a = 84 \text{ mm}, c = 27 \text{ mm}, A = 2497,8 \text{ mm}^2.$



$$b = d$$

$$x = y$$

$$e = f$$

$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2497,8}{84+27} = \underline{45,0 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a-c}{2} = \frac{84-27}{2} = 28,5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{45,0^2 + 28,5^2} = \underline{53,3 \text{ mm}}$$

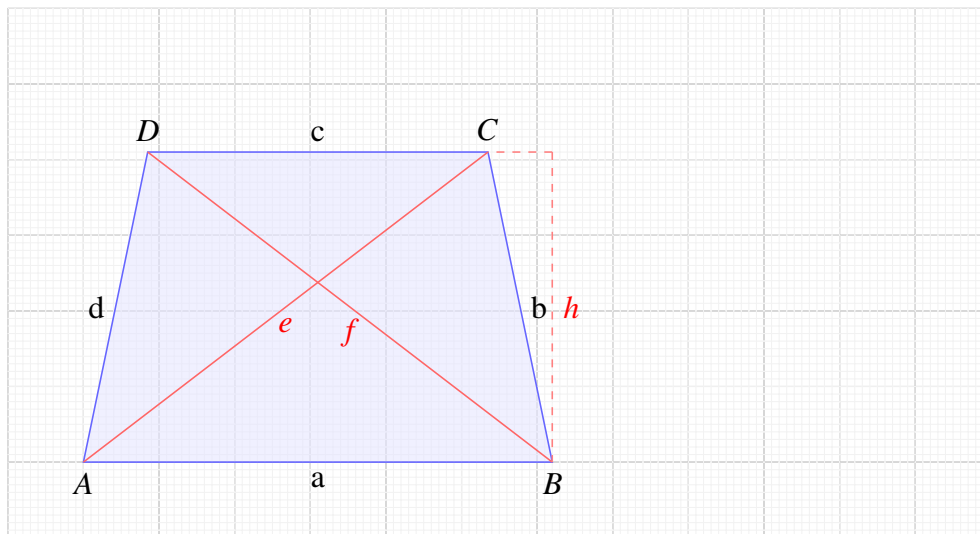
Phytagoras

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

$$e = \sqrt{h^2 + (c+x)^2} = \sqrt{45,0^2 + (27+28,5)^2} = \underline{71,5 \text{ mm}}$$

$$U = a + c + 2 \cdot b = 84 + 27 + 2 \cdot 53,3 = \underline{217,5 \text{ mm}}$$

49 $b = 41,9 \text{ mm}$, $c = 45 \text{ mm}$, $h = 41,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{41,9^2 - 41,0^2} = 8,5 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 45 + 2 \cdot 8,5 = \underline{62 \text{ mm}}$$

Phytagoras

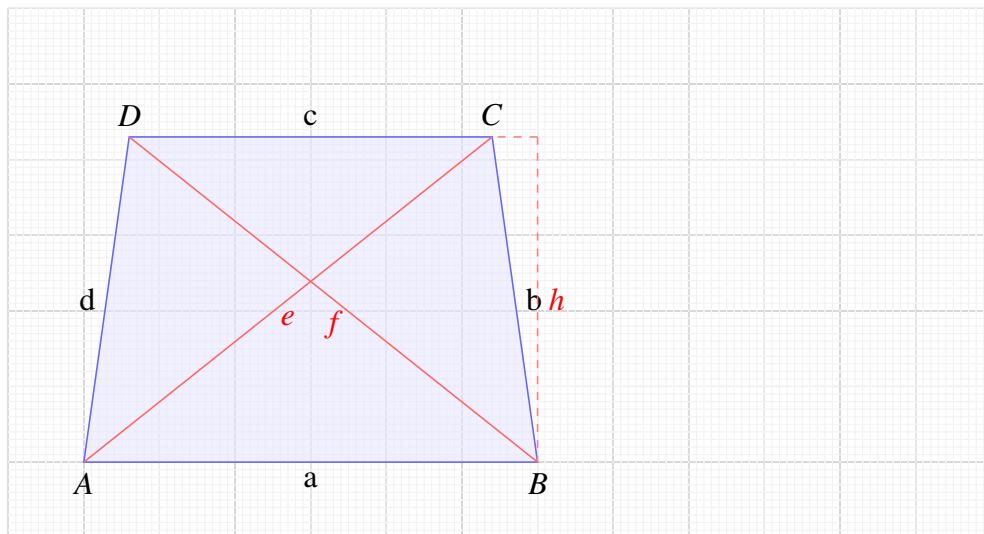
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{41,0^2 + (45 + 8,5)^2} = \underline{67,4 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{62 + 45}{2} \cdot 41,0 = \underline{2193,4 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 62 + 45 + 2 \cdot 41,9 = \underline{190,7 \text{ mm}}$$

50 $c = 48 \text{ mm}$, $e = 69,0 \text{ mm}$, $h = 43,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow x = \sqrt{e^2 - h^2} - c = \sqrt{69,0^2 - 43,0^2} - 48 = 6 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 48 + 2 \cdot 6 = \underline{60 \text{ mm}}$$

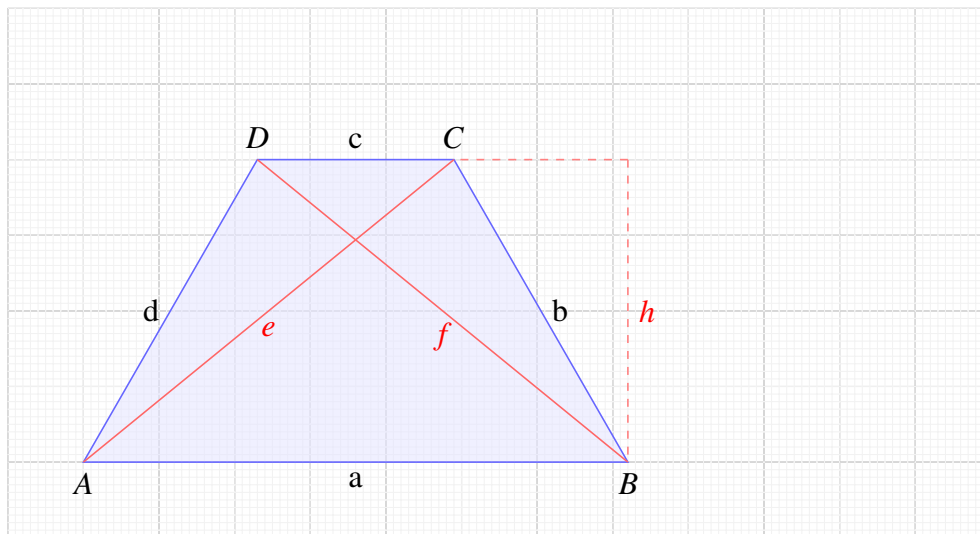
Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{43,0^2 + 6^2} = \underline{43,4 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{60 + 48}{2} \cdot 43,0 = \underline{2322,2 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 60 + 48 + 2 \cdot 43,4 = \underline{194,8 \text{ mm}}$$

51 $a = 72 \text{ mm}$, $e = 63,3 \text{ mm}$, $h = 40,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + y^2 \Rightarrow y = \sqrt{e^2 - h^2} = \sqrt{63,3^2 - 40,0^2} = 49 \text{ mm}$$

$$x = a - y = 72 - 49 = 23 \text{ mm}$$

Phytagoras

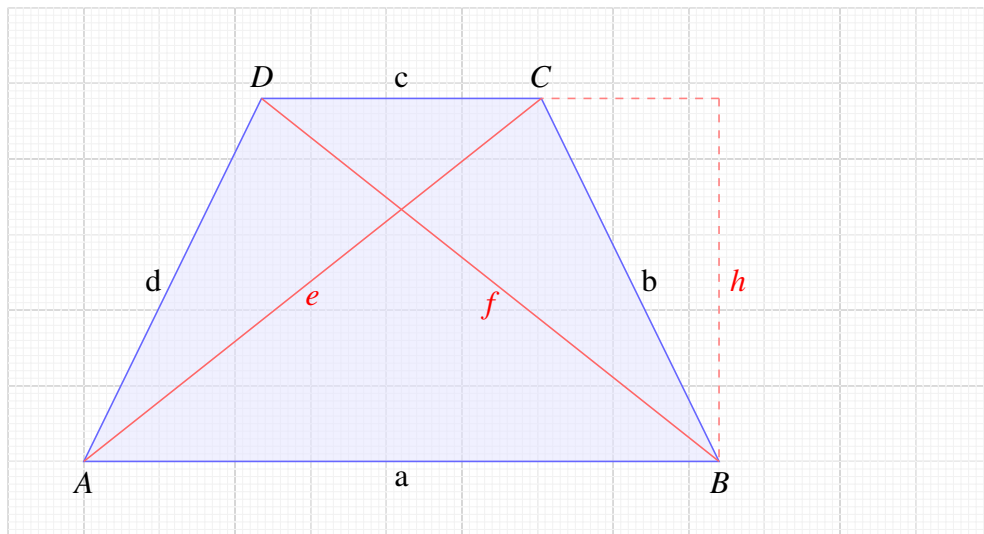
$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{40,0^2 + 23^2} = \underline{46,1 \text{ mm}}$$

$$c = a - 2 \cdot x = 72 - 2 \cdot 23 = \underline{26 \text{ mm}}$$

$$A = \frac{a+c}{2} \cdot h = \frac{72+26}{2} \cdot 40,0 = \underline{1959,9 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 72 + 26 + 2 \cdot 46,1 = \underline{190,3 \text{ mm}}$$

52 $a = 84 \text{ mm}, b = 53,4 \text{ mm}, e = 77,2 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

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

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

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

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

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

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

$$x = \frac{a^2 + b^2 - e^2}{2a} = \frac{84^2 + 53,4^2 - 77,2^2}{284} = 23,5$$

$$c = a - 2 \cdot x = 84 - 2 \cdot 23,5 = \underline{37 \text{ mm}}$$

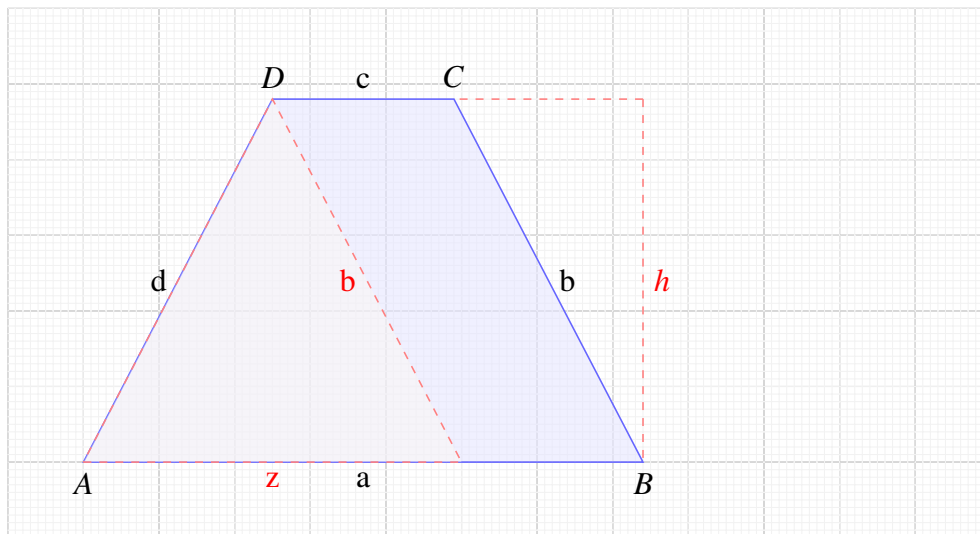
Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{53,4^2 - 23,5^2} = \underline{48,0 \text{ mm}}$$

$$A = \frac{a+c}{2} \cdot h = \frac{84+37}{2} \cdot 48,0 = \underline{2903,7 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 84 + 37 + 2 \cdot 53,4 = \underline{227,9 \text{ mm}}$$

53 $a = 74 \text{ mm}$, $b = 54,1 \text{ mm}$, $h = 48,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{54,1^2 - 48,0^2} = 25,0 \text{ mm}$$

$$c = a - 2 \cdot x = 74 - 2 \cdot 25,0 = \underline{24 \text{ mm}}$$

Phytagoras

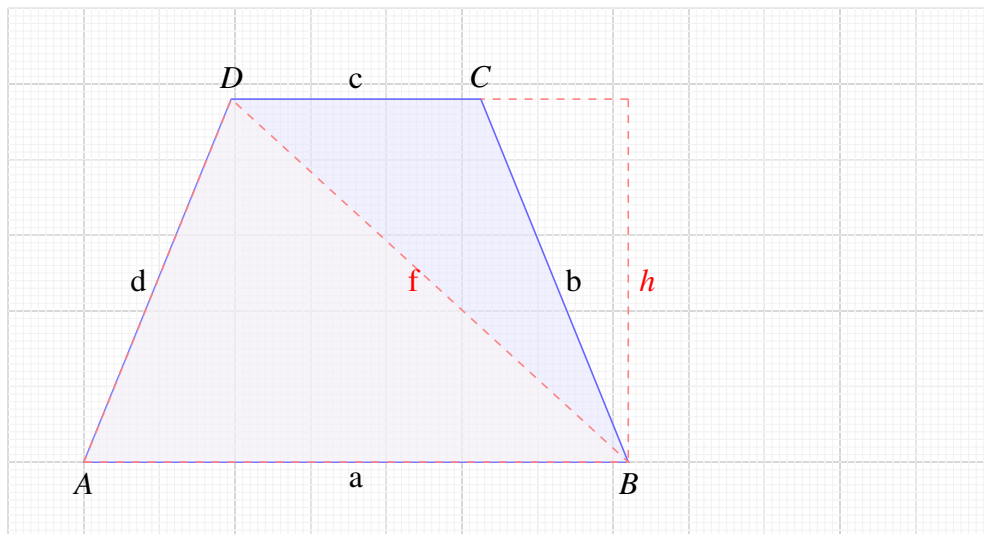
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{48,0^2 + (24 + 25,0)^2} = \underline{68,6 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{74 + 24}{2} \cdot 48,0 = \underline{2352,0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 74 + 24 + 2 \cdot 54,1 = \underline{206,2 \text{ mm}}$$

54 $a = 72 \text{ mm}, b = 51,8 \text{ mm}, c = 33 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{72 - 33}{2} = 19,5 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{51,8^2 - 19,5^2} = \underline{48,0 \text{ mm}}$$

Phytagoras

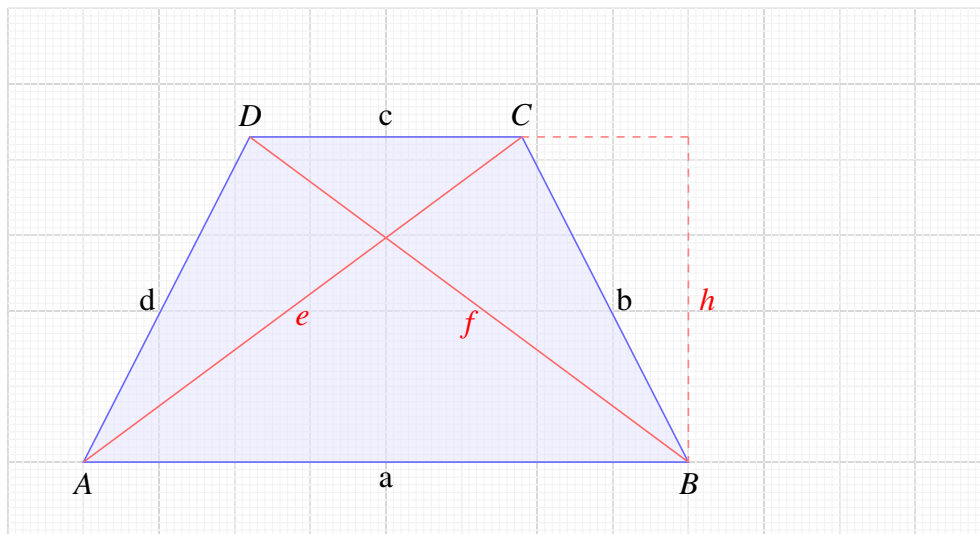
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{48,0^2 + (33 + 19,5)^2} = \underline{71,1 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{72 + 33}{2} \cdot 48,0 = \underline{2520,0 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 72 + 33 + 2 \cdot 51,8 = \underline{208,6 \text{ mm}}$$

55 $a = 80 \text{ mm}, b = 48,3 \text{ mm}, U = 212,6 \text{ mm}.$



$$b = d$$

$$x = y$$

$$e = f$$

$$U = a + c + 2 \cdot b \Rightarrow c = U - a - 2 \cdot b = 212,6 - 80 - 2 \cdot 48,3 = \underline{36 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a - c}{2} = \frac{80 - 36}{2} = 22 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow h = \sqrt{b^2 - x^2} = \sqrt{48,3^2 - 22^2} = \underline{43,0 \text{ mm}}$$

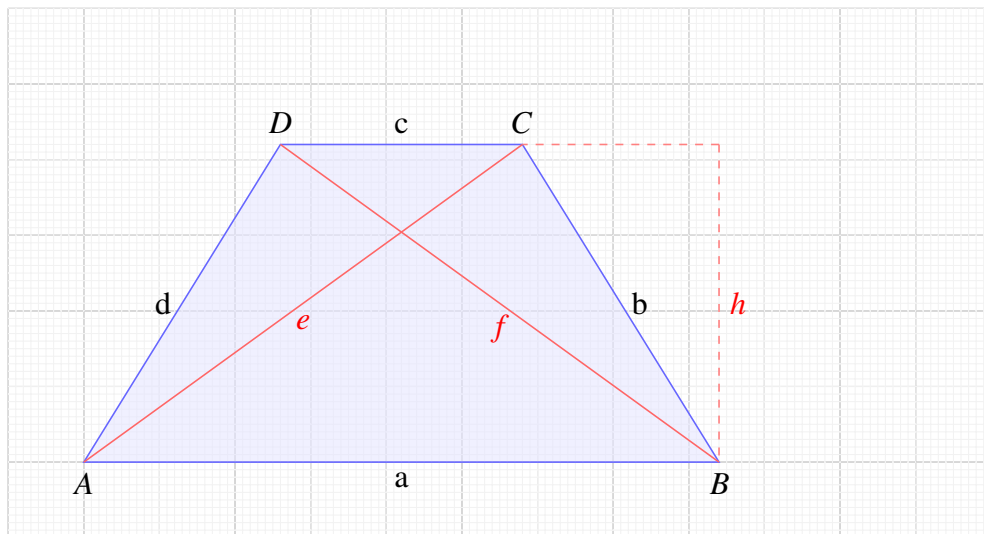
Phytagoras

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

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{43,0^2 + (36 + 22)^2} = \underline{72,2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{80 + 36}{2} \cdot 43,0 = \underline{2493,9 \text{ mm}^2}$$

56 $a = 84 \text{ mm}, c = 32 \text{ mm}, A = 2436,2 \text{ mm}^2$.



$$b = d$$

$$x = y$$

$$e = f$$

$$A = \frac{a+c}{2} \cdot h \Rightarrow h = \frac{2 \cdot A}{a+c} = \frac{2 \cdot 2436,2}{84+32} = \underline{42,0 \text{ mm}}$$

$$c = a - 2 \cdot x \Rightarrow x = \frac{a-c}{2} = \frac{84-32}{2} = 26,0 \text{ mm}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{42,0^2 + 26,0^2} = \underline{49,4 \text{ mm}}$$

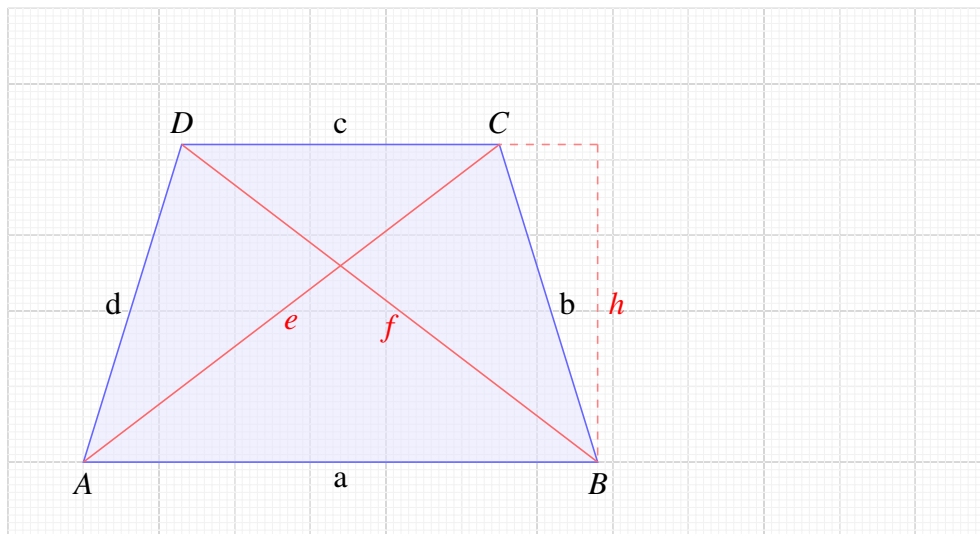
Phytagoras

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

$$e = \sqrt{h^2 + (c+x)^2} = \sqrt{42,0^2 + (32+26,0)^2} = \underline{71,6 \text{ mm}}$$

$$U = a + c + 2 \cdot b = 84 + 32 + 2 \cdot 49,4 = \underline{214,8 \text{ mm}}$$

57 $b = 44,0 \text{ mm}$, $c = 42 \text{ mm}$, $h = 42,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow x = \sqrt{b^2 - h^2} = \sqrt{44,0^2 - 42,0^2} = 13 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 42 + 2 \cdot 13 = \underline{68 \text{ mm}}$$

Phytagoras

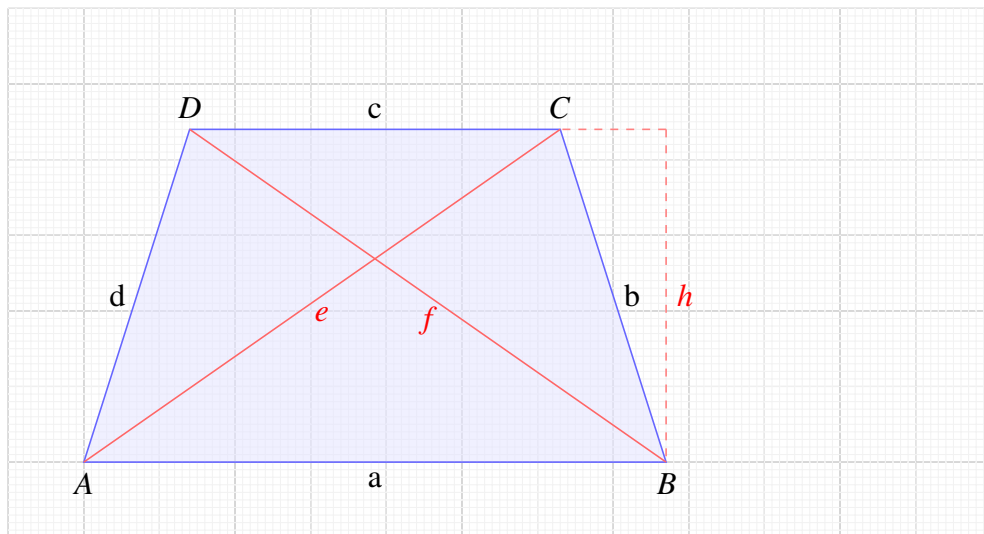
$$e^2 = h^2 + (c + x)^2$$

$$e = \sqrt{h^2 + (c + x)^2} = \sqrt{42,0^2 + (42 + 13)^2} = \underline{69,2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{68 + 42}{2} \cdot 42,0 = \underline{2310,2 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 68 + 42 + 2 \cdot 44,0 = \underline{197,9 \text{ mm}}$$

58 $c = 49 \text{ mm}$, $e = 76,8 \text{ mm}$, $h = 44,0 \text{ mm}$.



$$b = d$$

$$x = y$$

$$e = f$$

Phytagoras

$$e^2 = h^2 + (c + x)^2 \Rightarrow x = \sqrt{e^2 - h^2} - c = \sqrt{76,8^2 - 44,0^2} - 49 = 14,0 \text{ mm}$$

$$c = a - 2 \cdot x \Rightarrow a = c + 2 \cdot x = 49 + 2 \cdot 14,0 = \underline{77 \text{ mm}}$$

Phytagoras

$$b^2 = h^2 + x^2 \Rightarrow b = \sqrt{h^2 + x^2} = \sqrt{44,0^2 + 14,0^2} = \underline{46,2 \text{ mm}}$$

$$A = \frac{a + c}{2} \cdot h = \frac{77 + 49}{2} \cdot 44,0 = \underline{2771,8 \text{ mm}^2}$$

$$U = a + c + 2 \cdot b = 77 + 49 + 2 \cdot 46,2 = \underline{218,3 \text{ mm}}$$