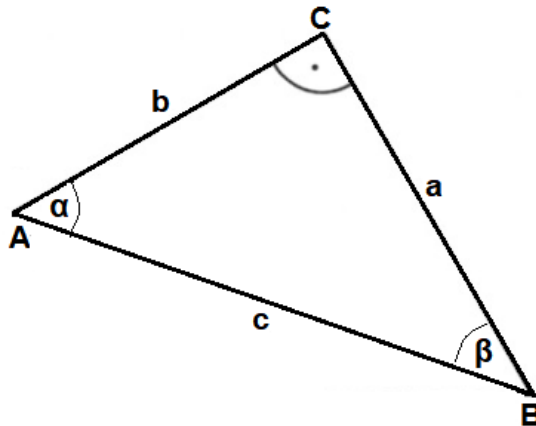


Mathematik-Aufgabenpool

> Trigonometrie II (rechtwinklige Dreiecke)

Einleitung: In einem rechtwinkligen Dreieck $\triangle ABC$ mit den Seiten a, b, c und den Winkeln α, β, γ bei $\gamma = 90^\circ$ heißen a und b Katheten, c Hypotenuse. Die Kathete, die gegenüber einem Winkel α oder β liegt, heißt Gegenkathete (bei Winkel α Seite a , bei Winkel β Seite b), die Kathete, die an einem Winkel α oder β liegt, heißt Ankathete (bei Winkel α Seite b , bei Winkel β Seite a).

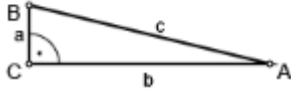
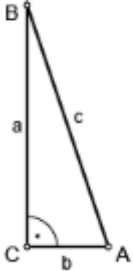
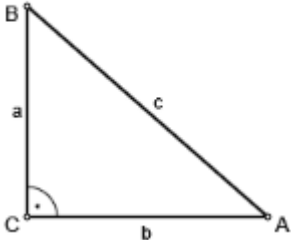
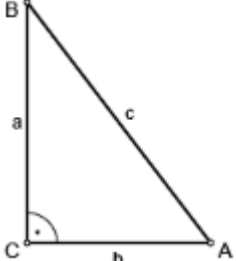
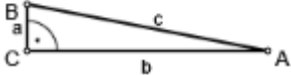


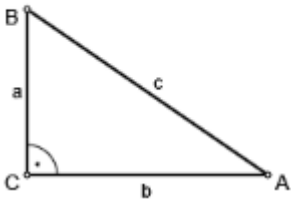
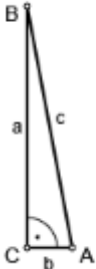
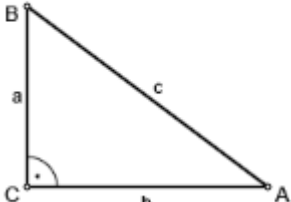
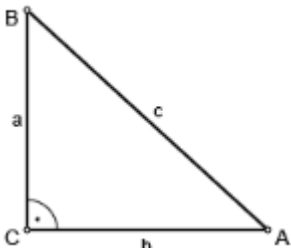
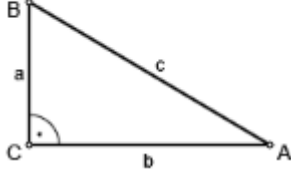
Rechtwinkliges Dreieck: Seiten a, b, c ; Winkel $\alpha, \beta, \gamma=90^\circ$

Formelsammlung:

Satz des Pythagoras	$c^2 = a^2 + b^2 \Rightarrow c = \sqrt{a^2 + b^2}$ (Hypotenuse)		
	$a^2 = c^2 - b^2 \Rightarrow a = \sqrt{c^2 - b^2}$ (Kathete)		
	$b^2 = c^2 - a^2 \Rightarrow b = \sqrt{c^2 - a^2}$ (Kathete)		
Trigonometrische Beziehungen (Sinus, Kosinus, Tangens)	$\sin \alpha = \frac{a}{c} = \frac{\text{Gegenkathete}}{\text{Hypotenuse}}$	$\cos \alpha = \frac{b}{c} = \frac{\text{Ankathete}}{\text{Hypotenuse}}$	$\tan \alpha = \frac{a}{b} = \frac{\text{Gegenkathete}}{\text{Ankathete}}$
	$\sin \beta = \frac{b}{c} = \frac{\text{Gegenkathete}}{\text{Hypotenuse}}$	$\cos \beta = \frac{a}{c} = \frac{\text{Ankathete}}{\text{Hypotenuse}}$	$\tan \beta = \frac{b}{a} = \frac{\text{Gegenkathete}}{\text{Ankathete}}$
Winkel	$\alpha + \beta = 90^\circ$	$\alpha = 90^\circ - \beta$	$\beta = 90^\circ - \alpha$
Umfang	$u = a + b + c$		
Fläche	$A = \frac{1}{2} ab$		

Aufgabe 1: Berechne die fehlenden Größen im rechtwinkligen Dreieck $\triangle ABC$ (Winkel $\gamma = 90^\circ$, a, b = Katheten, c = Hypotenuse, A = Fläche, u = Umfang).

Nr.	Gegeben:	Grafik:
1	$a = 1.3 \text{ cm}, \beta = 76.5^\circ$	
2	$a = 9.8 \text{ cm}, A = 16.2 \text{ cm}^2$	
3	$b = 4.7 \text{ cm}, c = 6.2 \text{ cm}$	
4	$a = 5.5 \text{ cm}, A = 11.6 \text{ cm}^2$	
5	$a = 1.3 \text{ cm}, A = 4.4 \text{ cm}^2$	

6	$a = 5.7 \text{ cm}, b = 8.3 \text{ cm}$	
7	$a = 6.3 \text{ cm}, \beta = 10.8^\circ$	
8	$b = 3.2 \text{ cm}, c = 4 \text{ cm}$	
9	$a = 3.2 \text{ cm}, \beta = 47.6^\circ$	
10	$b = 2.7 \text{ cm}, \alpha = 30.7^\circ$	

Vorgehensweise: Zur Ermittlung der fehlenden Größen beim rechtwinkligen Dreieck ist die obige Formelsammlung anzuwenden.

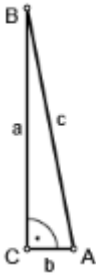
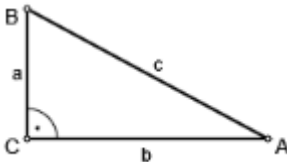
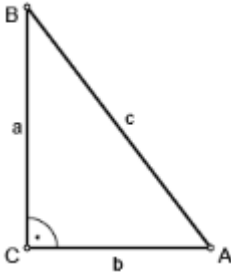
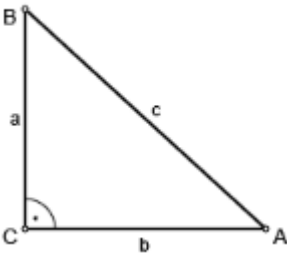
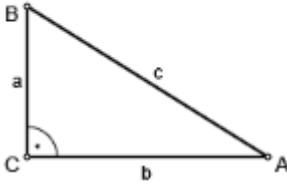
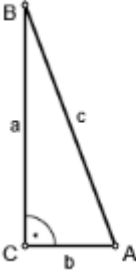
Lösungen:

Nr.	Gegeben:	Lösungen:
1	$a = 1.3 \text{ cm}, \beta = 76.5^\circ$	$a = 1.3 \text{ cm}, b = 5.4 \text{ cm}, c = 5.6 \text{ cm}, \alpha = 13.5^\circ, \beta = 76.5^\circ, A = 3.5 \text{ cm}^2, u = 12.3 \text{ cm}$
2	$a = 9.8 \text{ cm}, A = 16.2 \text{ cm}^2$	$a = 9.8 \text{ cm}, b = 3.3 \text{ cm}, c = 10.3 \text{ cm}, \alpha = 71.4^\circ, \beta = 18.6^\circ, A = 16.2 \text{ cm}^2, u = 23.4 \text{ cm}$
3	$b = 4.7 \text{ cm}, c = 6.2 \text{ cm}$	$a = 4.1 \text{ cm}, b = 4.7 \text{ cm}, c = 6.2 \text{ cm}, \alpha = 41.1^\circ, \beta = 48.9^\circ, A = 9.6 \text{ cm}^2, u = 15 \text{ cm}$

4	$a = 5.5 \text{ cm}, A = 11.6 \text{ cm}^2$	$a = 5.5 \text{ cm}, b = 4.2 \text{ cm}, c = 6.9 \text{ cm}, \alpha = 52.6^\circ, \beta = 37.4^\circ, A = 11.6 \text{ cm}^2, u = 16.6 \text{ cm}$
5	$a = 1.3 \text{ cm}, A = 4.4 \text{ cm}^2$	$a = 1.3 \text{ cm}, b = 6.7 \text{ cm}, c = 6.8 \text{ cm}, \alpha = 11^\circ, \beta = 79^\circ, A = 4.4 \text{ cm}^2, u = 14.8 \text{ cm}$
6	$a = 5.7 \text{ cm}, b = 8.3 \text{ cm}$	$a = 5.7 \text{ cm}, b = 8.3 \text{ cm}, c = 10.1 \text{ cm}, \alpha = 34.5^\circ, \beta = 55.5^\circ, A = 23.7 \text{ cm}^2, u = 24.1 \text{ cm}$
7	$a = 6.3 \text{ cm}, \beta = 10.8^\circ$	$a = 6.3 \text{ cm}, b = 1.2 \text{ cm}, c = 6.4 \text{ cm}, \alpha = 79.2^\circ, \beta = 10.8^\circ, A = 3.8 \text{ cm}^2, u = 13.9 \text{ cm}$
8	$b = 3.2 \text{ cm}, c = 4 \text{ cm}$	$a = 2.4 \text{ cm}, b = 3.2 \text{ cm}, c = 4 \text{ cm}, \alpha = 36.9^\circ, \beta = 53.1^\circ, A = 3.8 \text{ cm}^2, u = 9.6 \text{ cm}$
9	$a = 3.2 \text{ cm}, \beta = 47.6^\circ$	$a = 3.2 \text{ cm}, b = 3.5 \text{ cm}, c = 4.7 \text{ cm}, \alpha = 42.4^\circ, \beta = 47.6^\circ, A = 5.6 \text{ cm}^2, u = 11.4 \text{ cm}$
10	$b = 2.7 \text{ cm}, \alpha = 30.7^\circ$	$a = 1.6 \text{ cm}, b = 2.7 \text{ cm}, c = 3.1 \text{ cm}, \alpha = 30.7^\circ, \beta = 59.3^\circ, A = 2.2 \text{ cm}^2, u = 7.4 \text{ cm}$

Aufgabe 2: Berechne die fehlenden Größen im rechtwinkligen Dreieck $\triangle ABC$ (Winkel $\gamma = 90^\circ$, a, b = Katheten, c = Hypotenuse, A = Fläche, u = Umfang).

Nr.	Gegeben:	Grafik:
1	$b = 6.6 \text{ dm}, A = 22.4 \text{ dm}^2$	
2	$b = 7.1 \text{ dm}, \beta = 37.7^\circ$	
3	$b = 6.7 \text{ m}, c = 11.1 \text{ m}$	
4	$c = 11.6 \text{ mm}, \alpha = 56.6^\circ$	

5	$b = 1.7 \text{ dm}, A = 7.4 \text{ dm}^2$	
6	$b = 6.9 \text{ m}, A = 12.8 \text{ m}^2$	
7	$b = 5.4 \text{ dm}, \alpha = 52.7^\circ$	
8	$b = 5.7 \text{ cm}, A = 14.8 \text{ cm}^2$	
9	$c = 1.9 \text{ cm}, \beta = 58^\circ$	
10	$a = 5.6 \text{ dm}, c = 6 \text{ dm}$	

Vorgehensweise: Zur Ermittlung der fehlenden Größen beim rechtwinkligen Dreieck ist die obige Formelsammlung anzuwenden.

Lösungen:

Nr.	Gegeben:	Lösungen:
1	$b = 6.6 \text{ dm}, A = 22.4 \text{ dm}^2$	$a = 6.8 \text{ dm}, b = 6.6 \text{ dm}, c = 9.5 \text{ dm}, \alpha = 45.9^\circ, \beta = 44.1^\circ, A = 22.4 \text{ dm}^2, u = 22.9 \text{ dm}$
2	$b = 7.1 \text{ dm}, \beta = 37.7^\circ$	$a = 9.2 \text{ dm}, b = 7.1 \text{ dm}, c = 11.6 \text{ dm}, \alpha = 52.3^\circ, \beta = 37.7^\circ, A = 32.7 \text{ dm}^2, u = 27.9 \text{ dm}$
3	$b = 6.7 \text{ m}, c = 11.1 \text{ m}$	$a = 8.8 \text{ m}, b = 6.7 \text{ m}, c = 11.1 \text{ m}, \alpha = 52.7^\circ, \beta = 37.3^\circ, A = 29.5 \text{ m}^2, u = 26.6 \text{ m}$
4	$c = 11.6 \text{ mm}, \alpha = 56.6^\circ$	$a = 9.7 \text{ mm}, b = 6.4 \text{ mm}, c = 11.6 \text{ mm}, \alpha = 56.6^\circ, \beta = 33.4^\circ, A = 31 \text{ mm}^2, u = 27.7 \text{ mm}$
5	$b = 1.7 \text{ dm}, A = 7.4 \text{ dm}^2$	$a = 8.7 \text{ dm}, b = 1.7 \text{ dm}, c = 8.9 \text{ dm}, \alpha = 78.9^\circ, \beta = 11.1^\circ, A = 7.4 \text{ dm}^2, u = 19.3 \text{ dm}$
6	$b = 6.9 \text{ m}, A = 12.8 \text{ m}^2$	$a = 3.7 \text{ m}, b = 6.9 \text{ m}, c = 7.8 \text{ m}, \alpha = 28.2^\circ, \beta = 61.8^\circ, A = 12.8 \text{ m}^2, u = 18.4 \text{ m}$
7	$b = 5.4 \text{ dm}, \alpha = 52.7^\circ$	$a = 7.1 \text{ dm}, b = 5.4 \text{ dm}, c = 8.9 \text{ dm}, \alpha = 52.7^\circ, \beta = 37.3^\circ, A = 19.2 \text{ dm}^2, u = 21.4 \text{ dm}$
8	$b = 5.7 \text{ cm}, A = 14.8 \text{ cm}^2$	$a = 5.2 \text{ cm}, b = 5.7 \text{ cm}, c = 7.7 \text{ cm}, \alpha = 42.4^\circ, \beta = 47.6^\circ, A = 14.8 \text{ cm}^2, u = 18.6 \text{ cm}$
9	$c = 1.9 \text{ cm}, \beta = 58^\circ$	$a = 1 \text{ cm}, b = 1.6 \text{ cm}, c = 1.9 \text{ cm}, \alpha = 32^\circ, \beta = 58^\circ, A = 0.8 \text{ cm}^2, u = 4.5 \text{ cm}$
10	$a = 5.6 \text{ dm}, c = 6 \text{ dm}$	$a = 5.6 \text{ dm}, b = 2.1 \text{ dm}, c = 6 \text{ dm}, \alpha = 69.4^\circ, \beta = 20.6^\circ, A = 5.9 \text{ dm}^2, u = 13.7 \text{ dm}$

Aufgabe 3: Berechne die fehlenden Größen im rechtwinkligen Dreieck $\triangle ABC$ (Winkel $\gamma = 90^\circ$, a, b = Katheten, c = Hypotenuse, A = Fläche, u = Umfang).

Nr.	Gegeben:
1	$b = 2.5 \text{ cm}, c = 9.9 \text{ cm}$
2	$b = 2 \text{ cm}, A = 2 \text{ cm}^2$
3	$a = 2.9 \text{ cm}, A = 4.2 \text{ cm}^2$
4	$b = 2.4 \text{ cm}, \beta = 36.9^\circ$
5	$a = 8.3 \text{ cm}, \beta = 38.1^\circ$
6	$a = 8.3 \text{ cm}, b = 8.1 \text{ cm}$
7	$a = 3.8 \text{ cm}, \alpha = 34.2^\circ$
8	$a = 3.4 \text{ cm}, \alpha = 19.9^\circ$
9	$a = 4.7 \text{ cm}, b = 6.3 \text{ cm}$
10	$b = 1.9 \text{ cm}, A = 3.5 \text{ cm}^2$
11	$a = 7.8 \text{ cm}, \beta = 22.9^\circ$
12	$b = 4.6 \text{ cm}, c = 5.9 \text{ cm}$
13	$a = 7.4 \text{ cm}, c = 9.3 \text{ cm}$
14	$c = 12.3 \text{ cm}, \beta = 41.4^\circ$
15	$b = 1 \text{ cm}, \alpha = 77.2^\circ$
16	$a = 2.5 \text{ cm}, c = 3.4 \text{ cm}$
17	$b = 8.3 \text{ cm}, c = 8.4 \text{ cm}$
18	$a = 1.1 \text{ cm}, \alpha = 6.4^\circ$
19	$b = 2.1 \text{ cm}, c = 3.8 \text{ cm}$
20	$c = 12.4 \text{ cm}, \beta = 51.6^\circ$

Vorgehensweise: Zur Ermittlung der fehlenden Größen beim rechtwinkligen Dreieck ist die obige Formelsammlung anzuwenden.

Lösungen:

Nr.	Gegeben:	Lösungen:
1	b = 2.5 cm, c = 9.9 cm	a = 9.6 cm, b = 2.5 cm, c = 9.9 cm, $\alpha = 75.4^\circ$, $\beta = 14.6^\circ$, A = 12 cm ² , u = 22 cm
2	b = 2 cm, A = 2 cm ²	a = 2 cm, b = 2 cm, c = 2.8 cm, $\alpha = 45^\circ$, $\beta = 45^\circ$, A = 2 cm ² , u = 6.8 cm
3	a = 2.9 cm, A = 4.2 cm ²	a = 2.9 cm, b = 2.9 cm, c = 4.1 cm, $\alpha = 45^\circ$, $\beta = 45^\circ$, A = 4.2 cm ² , u = 9.9 cm
4	b = 2.4 cm, $\beta = 36.9^\circ$	a = 3.2 cm, b = 2.4 cm, c = 4 cm, $\alpha = 53.1^\circ$, $\beta = 36.9^\circ$, A = 3.8 cm ² , u = 9.6 cm
5	a = 8.3 cm, $\beta = 38.1^\circ$	a = 8.3 cm, b = 6.5 cm, c = 10.5 cm, $\alpha = 51.9^\circ$, $\beta = 38.1^\circ$, A = 27 cm ² , u = 25.3 cm
6	a = 8.3 cm, b = 8.1 cm	a = 8.3 cm, b = 8.1 cm, c = 11.6 cm, $\alpha = 45.7^\circ$, $\beta = 44.3^\circ$, A = 33.6 cm ² , u = 28 cm
7	a = 3.8 cm, $\alpha = 34.2^\circ$	a = 3.8 cm, b = 5.6 cm, c = 6.8 cm, $\alpha = 34.2^\circ$, $\beta = 55.8^\circ$, A = 10.6 cm ² , u = 16.2 cm
8	a = 3.4 cm, $\alpha = 19.9^\circ$	a = 3.4 cm, b = 9.4 cm, c = 10 cm, $\alpha = 19.9^\circ$, $\beta = 70.1^\circ$, A = 16 cm ² , u = 22.8 cm
9	a = 4.7 cm, b = 6.3 cm	a = 4.7 cm, b = 6.3 cm, c = 7.9 cm, $\alpha = 36.7^\circ$, $\beta = 53.3^\circ$, A = 14.8 cm ² , u = 18.9 cm
10	b = 1.9 cm, A = 3.5 cm ²	a = 3.7 cm, b = 1.9 cm, c = 4.2 cm, $\alpha = 62.8^\circ$, $\beta = 27.2^\circ$, A = 3.5 cm ² , u = 9.8 cm
11	a = 7.8 cm, $\beta = 22.9^\circ$	a = 7.8 cm, b = 3.3 cm, c = 8.5 cm, $\alpha = 67.1^\circ$, $\beta = 22.9^\circ$, A = 12.9 cm ² , u = 19.6 cm
12	b = 4.6 cm, c = 5.9 cm	a = 3.7 cm, b = 4.6 cm, c = 5.9 cm, $\alpha = 38.8^\circ$, $\beta = 51.2^\circ$, A = 8.5 cm ² , u = 14.2 cm
13	a = 7.4 cm, c = 9.3 cm	a = 7.4 cm, b = 5.7 cm, c = 9.3 cm, $\alpha = 52.4^\circ$, $\beta = 37.6^\circ$, A = 21.1 cm ² , u = 22.4 cm
14	c = 12.3 cm, $\beta = 41.4^\circ$	a = 9.2 cm, b = 8.1 cm, c = 12.3 cm, $\alpha = 48.6^\circ$, $\beta = 41.4^\circ$, A = 37.3 cm ² , u = 29.6 cm
15	b = 1 cm, $\alpha = 77.2^\circ$	a = 4.4 cm, b = 1 cm, c = 4.5 cm, $\alpha = 77.2^\circ$, $\beta = 12.8^\circ$, A = 2.2 cm ² , u = 9.9 cm
16	a = 2.5 cm, c = 3.4 cm	a = 2.5 cm, b = 2.3 cm, c = 3.4 cm, $\alpha = 47.4^\circ$, $\beta = 42.6^\circ$, A = 2.9 cm ² , u = 8.2 cm
17	b = 8.3 cm, c = 8.4 cm	a = 1.5 cm, b = 8.3 cm, c = 8.4 cm, $\alpha = 10.2^\circ$, $\beta = 79.8^\circ$, A = 6.2 cm ² , u = 18.2 cm
18	a = 1.1 cm, $\alpha = 6.4^\circ$	a = 1.1 cm, b = 9.8 cm, c = 9.9 cm, $\alpha = 6.4^\circ$, $\beta = 83.6^\circ$, A = 5.4 cm ² , u = 20.8 cm
19	b = 2.1 cm, c = 3.8 cm	a = 3.2 cm, b = 2.1 cm, c = 3.8 cm, $\alpha = 56.7^\circ$, $\beta = 33.3^\circ$, A = 3.4 cm ² , u = 9.1 cm
20	c = 12.4 cm, $\beta = 51.6^\circ$	a = 7.7 cm, b = 9.7 cm, c = 12.4 cm, $\alpha = 38.4^\circ$, $\beta = 51.6^\circ$, A = 37.3 cm ² , u = 29.8 cm

Aufgabe 4: Berechne die fehlenden Größen im rechtwinkligen Dreieck ΔABC (Winkel $\gamma = 90^\circ$, a, b = Katheten, c = Hypotenuse, A = Fläche, u = Umfang).

Nr.	Gegeben:
1	a = 19.4 dm, c = 25.3 dm
2	a = 14.2 m, $\alpha = 40.9^\circ$
3	a = 15.1 cm, $\alpha = 58.6^\circ$
4	b = 17.7 dm, $\alpha = 41.4^\circ$
5	c = 15.9 m, $\beta = 62.6^\circ$
6	a = 10.5 cm, A = 77.7 cm ²
7	b = 15.5 m, c = 19.3 m
8	a = 11.5 m, A = 73 m ²
9	a = 7.9 cm, $\alpha = 43.2^\circ$
10	c = 13.1 cm, $\alpha = 31.9^\circ$
11	a = 18 dm, A = 137.7 dm ²
12	b = 8.2 mm, $\alpha = 57.4^\circ$
13	a = 18.9 cm, A = 135.1 cm ²
14	b = 5.8 dm, $\beta = 24^\circ$
15	a = 8.9 cm, A = 72.1 cm ²

16	$b = 7.7 \text{ cm}, c = 12.5 \text{ cm}$
17	$c = 17 \text{ cm}, \alpha = 57.2^\circ$
18	$b = 13.9 \text{ cm}, \alpha = 27.7^\circ$
19	$a = 17.6 \text{ dm}, \beta = 33.2^\circ$
20	$a = 17.9 \text{ m}, \beta = 22.5^\circ$

Vorgehensweise: Zur Ermittlung der fehlenden Größen beim rechtwinkligen Dreieck ist die obige Formelsammlung anzuwenden.

Lösungen:

Nr.	Gegeben:	Lösungen:
1	$a = 19.4 \text{ dm}, c = 25.3 \text{ dm}$	$a = 19.4 \text{ dm}, b = 16.3 \text{ dm}, c = 25.3 \text{ dm}, \alpha = 50^\circ, \beta = 40^\circ, A = 158.1 \text{ dm}^2, u = 61 \text{ dm}$
2	$a = 14.2 \text{ m}, \alpha = 40.9^\circ$	$a = 14.2 \text{ m}, b = 16.4 \text{ m}, c = 21.7 \text{ m}, \alpha = 40.9^\circ, \beta = 49.1^\circ, A = 116.4 \text{ m}^2, u = 52.3 \text{ m}$
3	$a = 15.1 \text{ cm}, \alpha = 58.6^\circ$	$a = 15.1 \text{ cm}, b = 9.2 \text{ cm}, c = 17.7 \text{ cm}, \alpha = 58.6^\circ, \beta = 31.4^\circ, A = 69.5 \text{ cm}^2, u = 42 \text{ cm}$
4	$b = 17.7 \text{ dm}, \alpha = 41.4^\circ$	$a = 15.6 \text{ dm}, b = 17.7 \text{ dm}, c = 23.6 \text{ dm}, \alpha = 41.4^\circ, \beta = 48.6^\circ, A = 138.1 \text{ dm}^2, u = 56.9 \text{ dm}$
5	$c = 15.9 \text{ m}, \beta = 62.6^\circ$	$a = 7.3 \text{ m}, b = 14.1 \text{ m}, c = 15.9 \text{ m}, \alpha = 27.4^\circ, \beta = 62.6^\circ, A = 51.5 \text{ m}^2, u = 37.3 \text{ m}$
6	$a = 10.5 \text{ cm}, A = 77.7 \text{ cm}^2$	$a = 10.5 \text{ cm}, b = 14.8 \text{ cm}, c = 18.1 \text{ cm}, \alpha = 35.4^\circ, \beta = 54.6^\circ, A = 77.7 \text{ cm}^2, u = 43.4 \text{ cm}$
7	$b = 15.5 \text{ m}, c = 19.3 \text{ m}$	$a = 11.5 \text{ m}, b = 15.5 \text{ m}, c = 19.3 \text{ m}, \alpha = 36.6^\circ, \beta = 53.4^\circ, A = 89.1 \text{ m}^2, u = 46.3 \text{ m}$
8	$a = 11.5 \text{ m}, A = 73 \text{ m}^2$	$a = 11.5 \text{ m}, b = 12.7 \text{ m}, c = 17.1 \text{ m}, \alpha = 42.2^\circ, \beta = 47.8^\circ, A = 73 \text{ m}^2, u = 41.3 \text{ m}$
9	$a = 7.9 \text{ cm}, \alpha = 43.2^\circ$	$a = 7.9 \text{ cm}, b = 8.4 \text{ cm}, c = 11.5 \text{ cm}, \alpha = 43.2^\circ, \beta = 46.8^\circ, A = 33.2 \text{ cm}^2, u = 27.8 \text{ cm}$
10	$c = 13.1 \text{ cm}, \alpha = 31.9^\circ$	$a = 6.9 \text{ cm}, b = 11.1 \text{ cm}, c = 13.1 \text{ cm}, \alpha = 31.9^\circ, \beta = 58.1^\circ, A = 38.3 \text{ cm}^2, u = 31.1 \text{ cm}$
11	$a = 18 \text{ dm}, A = 137.7 \text{ dm}^2$	$a = 18 \text{ dm}, b = 15.3 \text{ dm}, c = 23.6 \text{ dm}, \alpha = 49.6^\circ, \beta = 40.4^\circ, A = 137.7 \text{ dm}^2, u = 56.9 \text{ dm}$
12	$b = 8.2 \text{ mm}, \alpha = 57.4^\circ$	$a = 12.8 \text{ mm}, b = 8.2 \text{ mm}, c = 15.2 \text{ mm}, \alpha = 57.4^\circ, \beta = 32.6^\circ, A = 52.5 \text{ mm}^2, u = 36.2 \text{ mm}$
13	$a = 18.9 \text{ cm}, A = 135.1 \text{ cm}^2$	$a = 18.9 \text{ cm}, b = 14.3 \text{ cm}, c = 23.7 \text{ cm}, \alpha = 52.9^\circ, \beta = 37.1^\circ, A = 135.1 \text{ cm}^2, u = 56.9 \text{ cm}$
14	$b = 5.8 \text{ dm}, \beta = 24^\circ$	$a = 13 \text{ dm}, b = 5.8 \text{ dm}, c = 14.2 \text{ dm}, \alpha = 66^\circ, \beta = 24^\circ, A = 37.7 \text{ dm}^2, u = 33 \text{ dm}$
15	$a = 8.9 \text{ cm}, A = 72.1 \text{ cm}^2$	$a = 8.9 \text{ cm}, b = 16.2 \text{ cm}, c = 18.5 \text{ cm}, \alpha = 28.8^\circ, \beta = 61.2^\circ, A = 72.1 \text{ cm}^2, u = 43.6 \text{ cm}$
16	$b = 7.7 \text{ cm}, c = 12.5 \text{ cm}$	$a = 9.8 \text{ cm}, b = 7.7 \text{ cm}, c = 12.5 \text{ cm}, \alpha = 51.8^\circ, \beta = 38.2^\circ, A = 37.7 \text{ cm}^2, u = 30 \text{ cm}$
17	$c = 17 \text{ cm}, \alpha = 57.2^\circ$	$a = 14.3 \text{ cm}, b = 9.2 \text{ cm}, c = 17 \text{ cm}, \alpha = 57.2^\circ, \beta = 32.8^\circ, A = 65.8 \text{ cm}^2, u = 40.5 \text{ cm}$
18	$b = 13.9 \text{ cm}, \alpha = 27.7^\circ$	$a = 7.3 \text{ cm}, b = 13.9 \text{ cm}, c = 15.7 \text{ cm}, \alpha = 27.7^\circ, \beta = 62.3^\circ, A = 50.7 \text{ cm}^2, u = 36.9 \text{ cm}$
19	$a = 17.6 \text{ dm}, \beta = 33.2^\circ$	$a = 17.6 \text{ dm}, b = 11.5 \text{ dm}, c = 21 \text{ dm}, \alpha = 56.8^\circ, \beta = 33.2^\circ, A = 101.2 \text{ dm}^2, u = 50.1 \text{ dm}$
20	$a = 17.9 \text{ m}, \beta = 22.5^\circ$	$a = 17.9 \text{ m}, b = 7.4 \text{ m}, c = 19.4 \text{ m}, \alpha = 67.5^\circ, \beta = 22.5^\circ, A = 66.2 \text{ m}^2, u = 44.7 \text{ m}$