Englische Übungen zu Satz des Pythagoras

1. A right-angled triangle is given by its hypotenuse $c = 15.3\ \text{cm}$ and its leg $b = 7.2\ \text{cm}$.
   1) How long is the other leg a? 2) Calculate the area of the triangle.

2. How long is the diagonal …
   a. of a rectangle with sides $a = 5.6\ \text{cm}$ and $b = 3.3\ \text{cm}$?
   b. of a square with side $a = 12.6\ \text{cm}$?

3. An isosceles triangle is given by its legs $a = b = 37.0\ \text{cm}$ and its base $c = 22.8\ \text{cm}$. Find the length of the height h_c and the area of the isosceles triangle.

4. Construct the equilateral triangle with $a = 7.1\ \text{cm}$ and calculate the length of the height and the area of the triangle.

5. An isosceles trapezoid ABCD is given by $a = 12.0\ \text{cm}$, $b = d = 3.9\ \text{cm}$ and $c = 9.0\ \text{cm}$.
   Find 1) the length of the diagonal $e = f$ 2) the area of the trapezoid.

6. A kite is given by the diagonals e and f and one of the sides a or b. Calculate the length of the other side and the area of the kite.
   a. $a = 6.1\ \text{cm}, e = 12.0\ \text{cm}, f = 10.2\ \text{cm}$
   b. $b = 5.3\ \text{cm}, e = 36.4\ \text{cm}, f = 9.0\ \text{cm}$

7. Calculate **1)** the volume **2)** the surface and **3)** the length of the diagonal of a cuboid with given edges a, b and c.

a. $a = 9.0\ \text{cm}, b = 7.2\ \text{cm}, c = 4.8\ \text{cm}$
b. $a = b = 3.2\ \text{m}, c = 2.4\ \text{m}$
c. $a = b = c = 5.8\ \text{m}$

8. The base of a regular hexagonal prism has edges with length $a = 6.5\ \text{cm}$. The height of the prism is $h = 10.4\ \text{cm}$.
Find **1)** the volume and **2)** the surface of the prism.

9. The main entrance to the Louvre museum in Paris has the shape of a regular square pyramid with side length $a = 35.42\ \text{m}$ and height $h = 21.65\ \text{m}$. Its lateral surface is made of glass. Compute the size of its lateral surface.

10. A regular hexagonal pyramid is given by its base edge and its height.
Find **1)** the volume **2)** the length of the lateral edge **3)** the height of the lateral faces and **4)** the surface of the pyramid.

a. $a = 2.8\ \text{cm}, h = 4.5\ \text{cm}$
b. $a = 12\ \text{m}, h = 12.6\ \text{m}$
c. $a = 5.6\ \text{m}, h = 10.5\ \text{m}$

Vocabulary

Englisch	Deutsch
right-angled triangle (right triangle)	rechtwinkliges Dreieck
hypotenuse	Hypotenuse
leg (in a right-angled triangle)	Kathete
rectangle	Rechteck
square	Quadrat

isosceles	gleichschenklig
leg (in an isosceles triangle)	Schenkel
base	Basis
trapezoid	Trapez
kite	Drachen, Deltoid
volume	Volumen, Rauminhalt
surface	Oberfläche
cuboid	Quader
diagonal of the cuboid	Raumdiagonale
edge	Kante
base	Grundfläche
regular	regelmäßig
hexagonal	sechsseitig, sechseckig
prism	Prisma
height	Höhe
pyramid	Pyramide
lateral edge	Seitenkante
lateral face	Seitenfläche
lateral surface	Mantelfläche

Solutions

1. $a = 13.5\ \text{cm}, A = 48.6\ \text{cm}^2$

2.

a. $d = 6.5\ \text{cm}$
b. $d \approx 17.82\ \text{cm}\ (17.8191\ldots)$

3. $h_c = 35.2\ \text{cm}, A = 401.28\ \text{cm}^2$

4. $h \approx 6.15\ \text{cm}\ (6.1487\ldots), A \approx 21.83\ \text{cm}^2 (21.8282\ldots)$

5. $e = f = 11.1\ \text{cm}, A = 37.8\ \text{cm}^2$

6.

a. $b \approx 10.04\ \text{cm}\ (10.0444\ldots), A = 61.2\text{cm}^2$
b. $a = 33.9\ \text{cm}, A = 163.8\ \text{cm}^2$

7.

a. $V = 311.04\ \text{cm}^3, O = 285.12\ \text{cm}^2, d \approx 12.49\ \text{cm}\ (12.4852\ldots)$
b. $V = 24.576\ \text{m}^3, O = 51.2\ \text{m}^2, d \approx 5.12\ \text{m}\ (5.1224\ldots)$
c. $V = 195.112\ \text{m}^3, O = 201.84\ \text{m}^2, d \approx 10.05\ \text{m}\ (10.0459\ldots)$

8. $O \approx 625.14\ \text{cm}^2 (625.137\ldots), V \approx 1141.59\ \text{cm}^3 (1141.594\ldots)$

9. $M \approx 1981.45\ m^2 (1981.4526 \ldots)$

10.

a. $V \approx 30.55\ cm^3, s = 5.3\ cm, h_a \approx 5.11\ cm, O \approx 63.31\ cm^2$

b. $V \approx 1571{,}32\ m^3, s = 17.4\ m, h_a \approx 16.33\ m, O \approx 962.10\ cm^2$

c. $V \approx 285.16\ m^3, s = 11.9\ m, h_a \approx 11.57\ m, O \approx 275.78\ m^2$