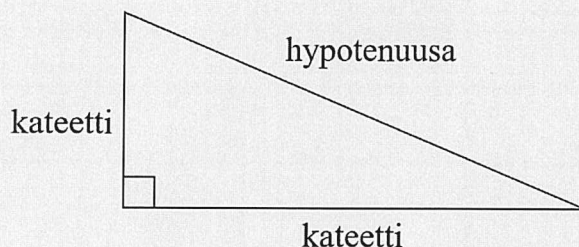


Suorakulmaisessa kolmiossa on yksi 90° :n kulma.

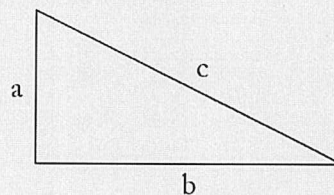
Suorakulmaisen kolmion kahta lyhintä sivua kutsutaan kateeteiksi, ja ne sijaitsevat suoran kulman vieressä.

Suorakulmaisen kolmion pisin sivu on hypotenuusa.



Suorakulmaisen kolmion kateettien neliöiden summa on yhtä suuri kuin hypotenuusan neliö. Tämä Pythagoraan lause voidaan kirjoittaa lyhyemmin $a^2 + b^2 = c^2$.

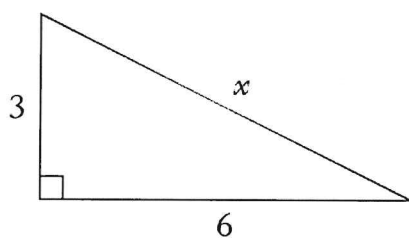
Pythagoraan lauseen avulla voidaan laskea suorakulmaisen kolmion yhden sivun pituus, jos kaksi muuta sivua tunnetaan.



ESIMERKKI 1

Laske tuntemattoman sivun pituus.

a)



$$a^2 + b^2 = c^2$$

$$3^2 + 6^2 = x^2$$

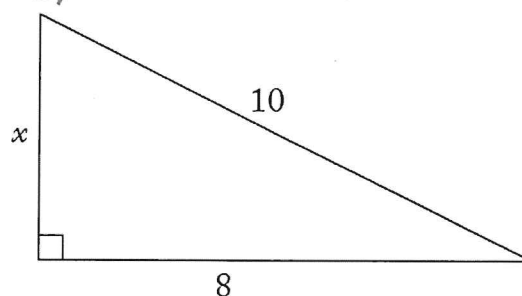
$$9 + 36 = x^2$$

$$x^2 = 45 \quad || \quad \sqrt{}$$

$$x = \sqrt{45}$$

$$x \approx 6,7$$

b)



$$a^2 + b^2 = c^2$$

$$x^2 + 8^2 = 10^2$$

$$x^2 + 64 = 100$$

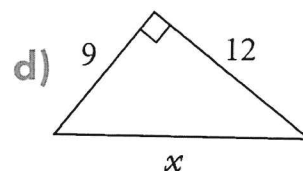
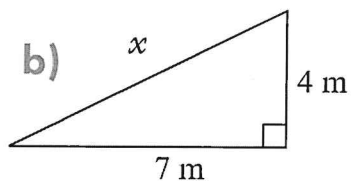
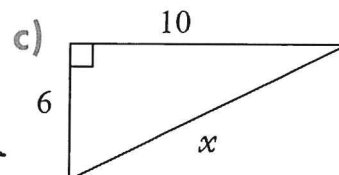
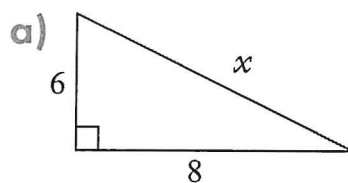
$$x^2 = 100 - 64 = 36 \quad || \quad \sqrt{}$$

$$x = \sqrt{36}$$

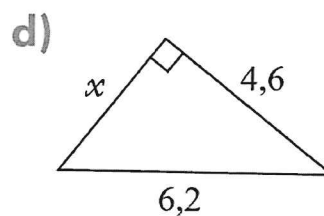
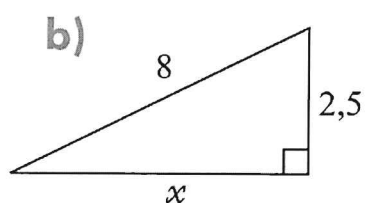
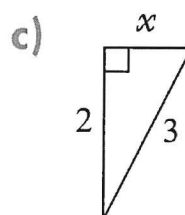
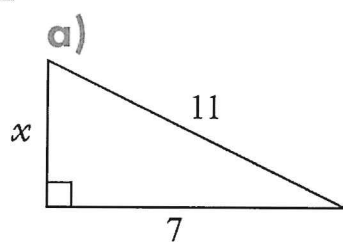
$$x = 6$$

865

Laske hypotenuusan pituus.

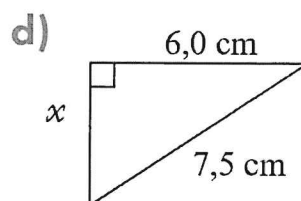
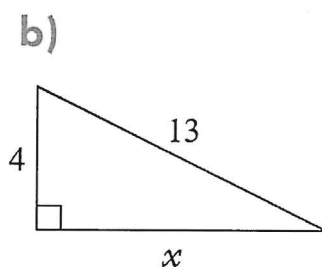
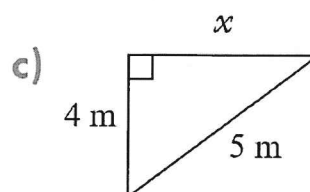
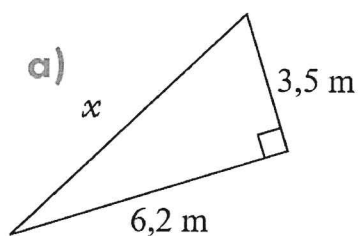


867

Laske x :llä merkityn kateetin pituus.

869

Laske tuntemattoman sivun pituus.



865

$$a^2 + b^2 = c^2$$

$$a) \quad 6^2 + 8^2 = x^2$$

$$36 + 64 = x^2$$

$$100 = x^2$$

$$x^2 = 100$$

//√

$$x = \sqrt{100}$$

$$x = 10$$

$$3^2 = 9$$

luvun
"kolme neliö"

$$\sqrt{9} = 3$$

"neliöjuuri"

$$b) \quad 4^2 + 7^2 = x^2$$

$$16 + 49 = x^2$$

$$x^2 = 65$$

//√

$$x = \sqrt{65}$$

$$x = 8,062...$$

$$x \approx 8 \text{ m}$$

$$c) \quad 6^2 + 10^2 = x^2$$

$$36 + 100 = x^2$$

$$x^2 = 136$$

//√

$$x = \sqrt{136}$$

$$x = 11,66...$$

$$x \approx 12$$

$$11,5... \approx 12$$

$$11,4... \approx 11$$

$$d) \quad 9^2 + 12^2 = x^2$$

$$81 + 144 = x^2$$

$$x^2 = 225$$

//√

$$x = \sqrt{225}$$

$$x = 15$$

867

a)

$$\begin{aligned}x^2 + 7^2 &= 11^2 \\x^2 + 49 &= 121 & \parallel -49 \\x^2 &= 72 & \parallel \sqrt{} \\x &= \sqrt{72} \\x &= 8,48... \\x &\approx 8,5\end{aligned}$$

b)

$$\begin{aligned}x^2 + 2,5^2 &= 8^2 \\x^2 + 6,25 &= 64 & \parallel -6,25 \\x^2 &= 57,75 & \parallel \sqrt{} \\x &= \sqrt{57,75} \\x &= 7,599... \\x &\approx 7,6\end{aligned}$$

c)

$$\begin{aligned}x^2 + 2^2 &= 3^2 \\x^2 + 4 &= 9 & \parallel -4 \\x^2 &= 5 & \parallel \sqrt{} \\x &= \sqrt{5} \\x &= 2,23... \\x &\approx 2,2\end{aligned}$$

d)

$$\begin{aligned}x^2 + 4,6^2 &= 6,2^2 \\x^2 + 21,16 &= 38,44 & \parallel -21,16 \\x^2 &= 17,28 & \parallel \sqrt{} \\x &= \sqrt{17,28} \\x &= 4,156... \\x &\approx 4,2\end{aligned}$$