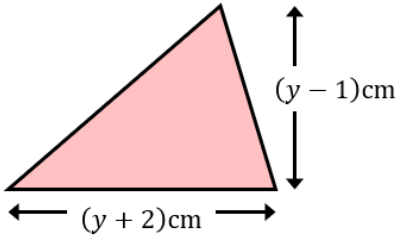
Quadratic Formula Problems in Context

(a)

A rectangle has a width of $(x + 4)$ cm, a length of $(x + 1)$ cm and an area of 20 cm^2. Show that $x^2 + 5x - 16 = 0$ and hence find the value of x to 1 decimal place.

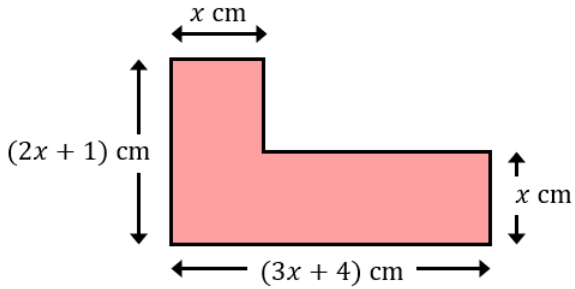
(b)

The triangle shown has an area of 32 cm^2. Show that $y^2 + y - 66 = 0$ and hence find the base and height of the triangle, both to 1 decimal place.



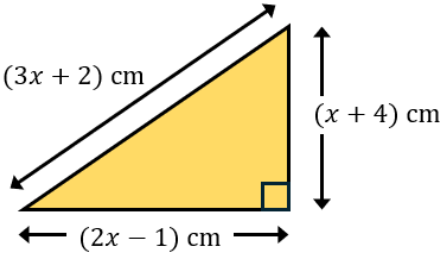
(c)

The area of the compound shape is 80 cm^2. By forming and solving a quadratic equation, find the value of x to 1 decimal place.



(d)

The right-angled triangle has sides of length $(x + 4), (2x - 1)$ and $(3x + 2)$ cm. Show that $4x^2 + 8x - 13 = 0$ and hence find the lengths of the sides of the triangle.



(e)

Kalia thinks of a positive irrational number, which she rounds to 2 decimal places. When she squares the number then doubles it, it is 1.0752 more than four times the number. By forming and solving a quadratic equation, find the number to 2 decimal places and the original irrational number Kalia thought of.

(f)

The total surface area of the cylinder shown is 300π cm^2. By forming and solving an equation in y, find the radius of the cylinder to 2 decimal places.