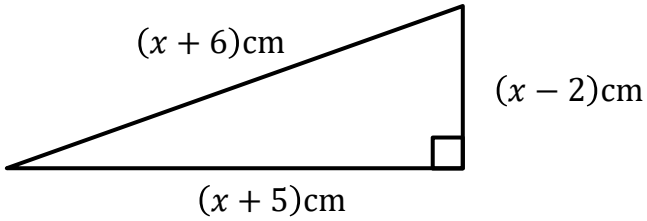
SET UP AND SOLVE QUADRATICS

Mitchell has started this question **correctly**

A right angled triangle has the dimensions shown in the diagram.



(a) Show that $x^2 - 6x - 7 = 0$

$$(x+5)^2 + (x-2)^2 = (x+6)^2$$
$$(x^2+10x+25) + (x^2-4x+4) = x^2+12x+36$$
$$2x^2 + 6x + 29 = x^2+12x+36$$
$$x^2 + 6x + 29 = 12x + 36$$
$$x^2 - 6x + 29 = 36$$
$$x^2 - 6x - 7 = 0$$

(b) Solve the quadratic equation and find the length of the longest side of the triangle.

Study the solution carefully and answer these questions.

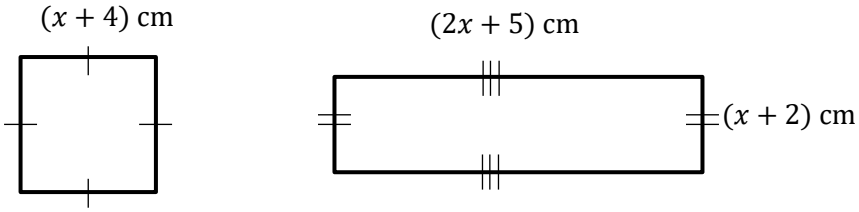
(1) How has Mitchell used the fact that it is a right angled triangle in his solution?

(2) Show how Mitchell could have calculated that
$(x-2)^2 = x^2 - 4x + 4$

(3) Solve the equation $x^2 - 6x - 7 = 0$ by factorising

(4) Find the longest side of the triangle

The square and the rectangle have the same area:



(a) Show that $x^2 + x - 6 = 0$

$(x+4)^2 = (x+2)(2x+5)$

$x^2 + 8x + 16 =$

(b) Solve the quadratic equation and find the dimensions of the rectangle

(c) Explain why both solutions to your quadratic equation cannot be used

A list of x numbers has a mean of $(x - 7)$

The total of these x numbers is -12

(a) Show that $x^2 - 7x + 12 = 0$

$$\text{Mean} = \frac{-12}{x}$$

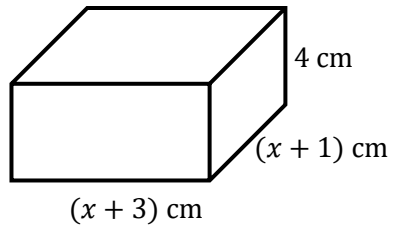
(b) Solve the quadratic equation and find two possible values of x

(c) Given that:

- All of the numbers are negative
- Mode = Median = -5

Show that only one of your solutions is valid

A cuboid has dimension shown



Given that the volume of the cuboid is 45 cm^3

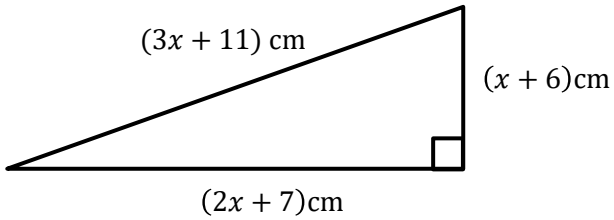
(a) Show that $4x^2 + 16x - 33 = 0$

(b) Solve the quadratic equation and state the dimensions of the cuboid.

Monica has enough paint to cover 80 cm^2

(c) Show that Monica has enough paint to completely cover the cuboid

A right angled triangle has the dimensions shown in the diagram.



(a) Show that $2x^2 + 13x + 18 = 0$

(b) Solve the quadratic equation and find the dimensions of the triangle