Solve:

$$\frac{2y}{5} = 4$$

$$\frac{3(2x+3)}{2} = x$$

Solve:

$$7x - 9 = 4x + 15$$

$$4x - 1 = 9x - 5$$

Solve:

$$3(x-5) = 7x + 12$$

$$5(q-3) = 12 - q$$

Solve the following pair of simultaneous equations

$$2x + 5y = 31$$

$$x + 6y = 33$$

Solve the simultaneous equations

$$2x - 3y = 3$$

$$3x + 6y = 1$$

Eddie and Caroline are going to the school play.

Eddie buys 6 adult tickets and 2 child tickets. He pays £39.
Caroline buys 5 adult tickets and 3 child tickets. She pays £36.50.

Work out the cost of an adult ticket and the cost of a child ticket.

Securing grade 5 – Algebra – Solving equations

Solve:

$$\frac{2y}{5} = 4$$

y = 10

$$\frac{3(2x+3)}{2} = x$$

6x + 9 = 2x

x = -9/4

Solve:

$$7x - 9 = 4x + 15$$

x = 8

$$4x - 1 = 9x - 5$$

4/5 = x

Solve:

$$3(x - 5) = 7x + 12$$

-27/4 = x

$$5(q - 3) = 12 - q$$

q = 27/6

Solve the following pair of simultaneous equations

$$2x + 5y = 31$$

$$x + 6y = 33$$

x = 3
y = 5

Solve the simultaneous equations

$$2x - 3y = 3$$

$$3x + 6y = 1$$

x = 1
y = -2
    6

Eddie and Caroline are going to the school play.

Eddie buys 6 adult tickets and 2 child tickets. He pays £39.
Caroline buys 5 adult tickets and 3 child tickets. She pays £36.50.

Work out the cost of an adult ticket and the cost of a child ticket.

a = £5.50
c = £3

Expand and simplify:

$4(x - 3y)$

$y(2y - 5)$

$2d(d + 3)$

$4(x + 5) + 3(x - 7)$

$4(a + 3) - 3(a - 2)$

Factorise fully:

$5x - 15$

$5 - 10m$

$x^2 - 3x$

$10t^2 + 15qt$

$2x^2y + 4xy^2$

Expand and simplify:

$(y + 2)(y + 5)$

$(x - 3)(x + 2)$

$(x - 5)(x - 3)$

$(w - 5)^2$

$(2x + 1)(3x - 2)$

Factorise fully:

$$y^2 + 8y + 12$$

$$x^2 + 7x - 18$$

$$x^2 - 2x - 8$$

$$x^2 - 6x + 8$$

$$x^2 - 49$$

$$x^2 - 25.$$

Rearrange to make k the subject of the formula

$$m = 8k + 3$$

Rearrange $v = u + 5t$ to make t the subject.

Rearrange the equation to make t the subject.

$$5(2 + t) = w$$

Securing grade 5 – Algebra – Expanding, Factorising, Rearranging equations

Expand and simplify:

$4(x - 3y)$ *4x – 12y*

$y(2y - 5)$ *2y² – 5y*

$2d(d + 3)$ *2d² – 6d*

$4(x + 5) + 3(x - 7)$

= 4x + 20 + 3x - 21

= 7x - 1

$4(a + 3) - 3(a - 2)$

= 4a + 12 – 3a + 6

= a + 18

Factorise fully:

$5x - 15$ *5(x-3)*

$5 - 10m$ *5(1-2m)*

$x^2 - 3x$ *x(x-3)*

$10t^2 + 15qt$ *5t(t+3q)*

$2x^2y + 4xy^2$ *2xy(x+2y)*

Expand and simplify:

$(y + 2)(y + 5)$ *y² + 7y + 10*

$(x - 3)(x + 2)$ *x² – x - 6*

$(x - 5)(x - 3)$ *x² – 8x + 15*

$(w - 5)^2$ *w² – 10x + 25*

$(2x + 1)(3x - 2)$ *6x² - x - 2*

Factorise fully:

$y^2 + 8y + 12$ *(y+2)(y+6)*

$x^2 + 7x - 18$ *(x+9)(x-2)*

$x^2 - 2x - 8$ *(x+2)(x-4)*

$x^2 - 6x + 8$ *(x-4)(x-2)*

$x^2 - 49$ *(x+7)(x-7)*

$x^2 - 25.$ *(x+5)(x-5)*

Rearrange to make *k* the subject of the formula

$m = 8k + 3$

m-3 = k
 8

Rearrange $v = u + 5t$ to make *t* the subject.

v-u = t
 5

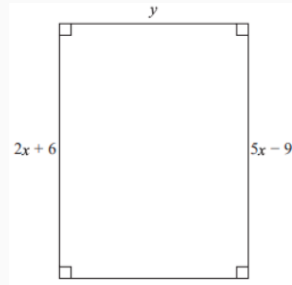Rearrange the equation to make *t* the subject.

$$5(2+t) = w$$

t = w-10
   5

Here is a kite.
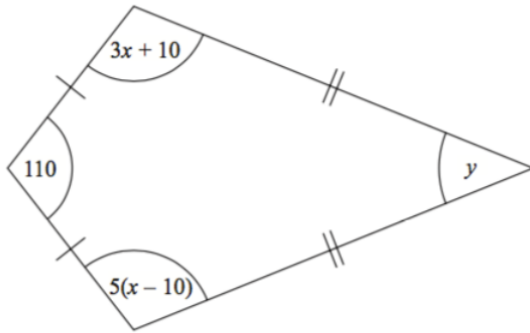
All angles are measured in degrees.
Work out the value of y.
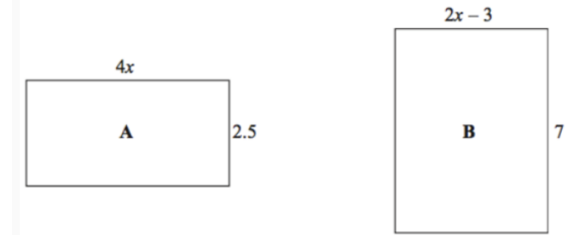
Here is a rectangle.

All measurements are in centimetres.

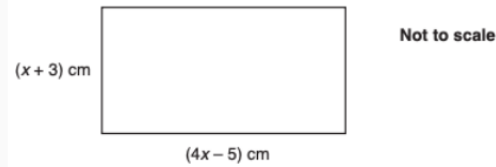The area of the rectangle is 48 cm^2.

Find the value of y.

Here are two rectangles.

All measurements are in centimetres.
The area of rectangle **A** is equal to the area of rectangle **B**.
Work out the perimeter of rectangle **B**.

This rectangle has length $(4x - 5)$ cm and width $(x + 3)$ cm.

$(x + 3)$ cm

Not to scale

$(4x - 5)$ cm

The perimeter of the rectangle is 46cm.

Calculate the area of the rectangle.

Katy buys x cakes.
Gugu buys 3 times as many cakes as Katy.
Deanna buys 2 more cakes than Katy.

Each cake costs 85p.
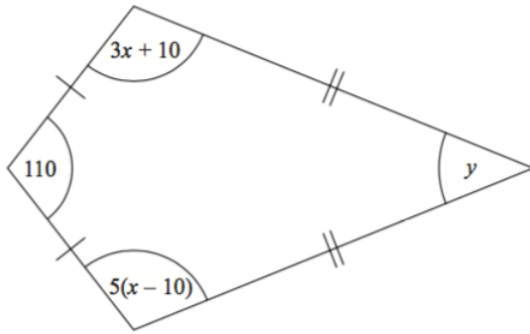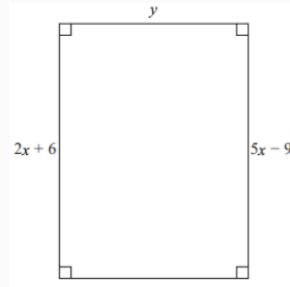The total cost of the cakes is £52.70.

How many cakes did each girl buy?

A family has four daughters, Molly, Daisy, Rosie and Tilly.

- Daisy is six years older than Molly.
- Molly is four years younger than Tilly.
- Rosie is one year older than double Molly's age.
- The total of their ages is 51.

Find the age of each of the four girls.

Blue panel

Here is a kite.

3x + 10

110

5(x − 10)

y

All angles are measured in degrees.
Work out the value of y.

y = 50ᵒ

Red panel

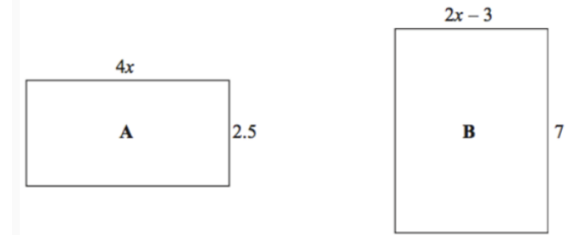Here is a rectangle.

y

2x + 6

5x − 9

All measurements are in centimetres.

The area of the rectangle is 48 cm².

Find the value of y.

y = 9.6cm

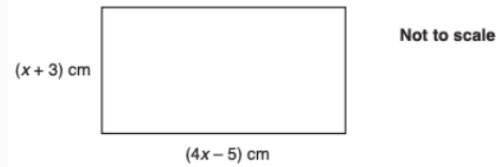## Yellow panel

Here are two rectangles.

2x − 3

4x

A

2.5

B

7

All measurements are in centimetres.
The area of rectangle A is equal to the area of rectangle B.
Work out the perimeter of rectangle B.

Perimeter = 29cm

This rectangle has length $(4x - 5)$ cm and width $(x + 3)$ cm.

$(x + 3)$ cm

Not to scale

$(4x - 5)$ cm

The perimeter of the rectangle is 46cm.

Calculate the area of the rectangle.

Area = 120cm²

Katy buys x cakes.
Gugu buys 3 times as many cakes as Katy.
Deanna buys 2 more cakes than Katy.

Each cake costs 85p.
The total cost of the cakes is £52.70.

How many cakes did each girl buy?

Katy = 12
Gugu = 36
Deanna = 14

A family has four daughters, Molly, Daisy, Rosie and Tilly.

- Daisy is six years older than Molly.
- Molly is four years younger than Tilly.
- Rosie is one year older than double Molly's age.
- The total of their ages is 51.

Find the age of each of the four girls.

Tilly = 12
Molly = 8
Daisy = 14
Rosie = 17

P is the point $(-4, 4)$
Q is the point $(1, -5)$

Find the gradient of PQ.

The point A has coordinates $(0, 2)$

The point B has coordinates $(-4, -1)$

Work out the gradient of the line AB

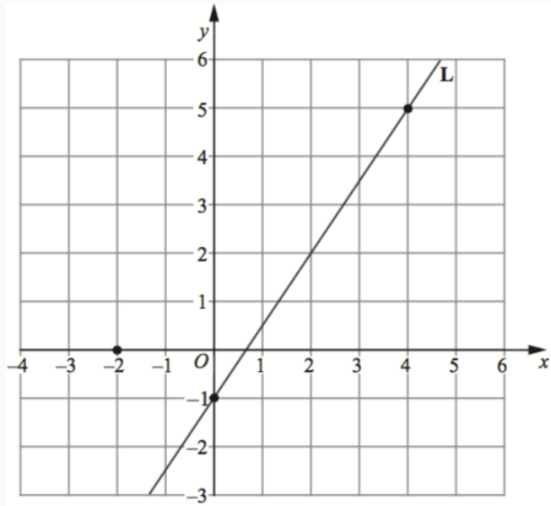A straight line goes through the points $(0, 0)$ and $(3, 6)$

Write the equation of this line.

A straight line is parallel to the line with equation $y = 5x + 20$
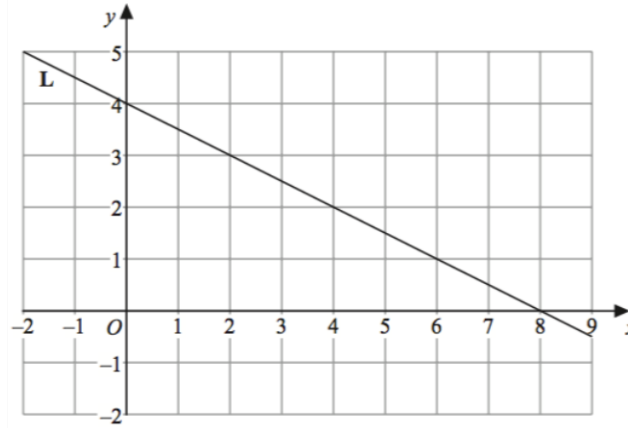It passes through the point $(0, 10)$

What is the equation of this straight line?

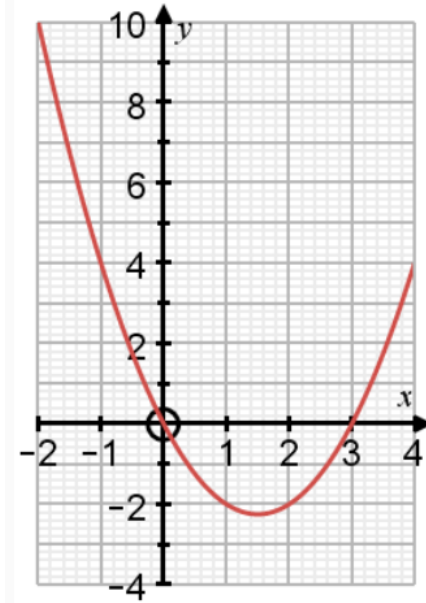The points (0, –1) and (4, 5) lie on the straight line **L**.

Write down an equation of **L**.

Find the equation of the line **L**.

The graph of $y = x^2 - 3x$ is drawn below.

Use the graph to solve the equation $x^2 - 3x = 2$

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P is the point (−4, 4)
Q is the point (1, −5)

Find the gradient of *PQ*.

Gradient = -9
          ———
           5

The point A has coordinates $(0, 2)$

The point B has coordinates $(-4, -1)$

Work out the gradient of the line AB

Gradient = 3
          ———
           4

A straight line goes through the points $(0, 0)$ and $(3, 6)$

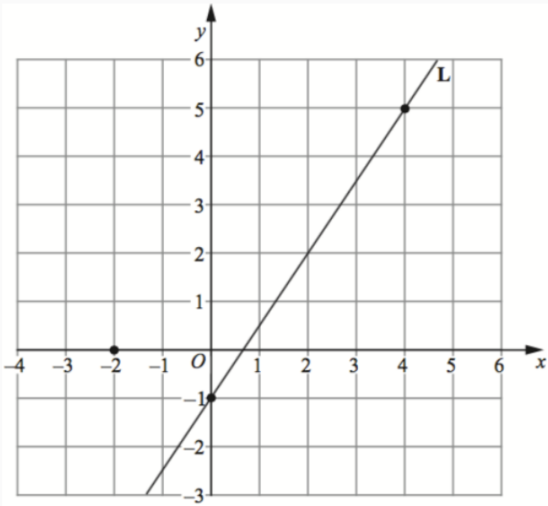Write the equation of this line.

$y = 2x$

A straight line is parallel to the line with equation $y = 5x + 20$
It passes through the point $(0, 10)$
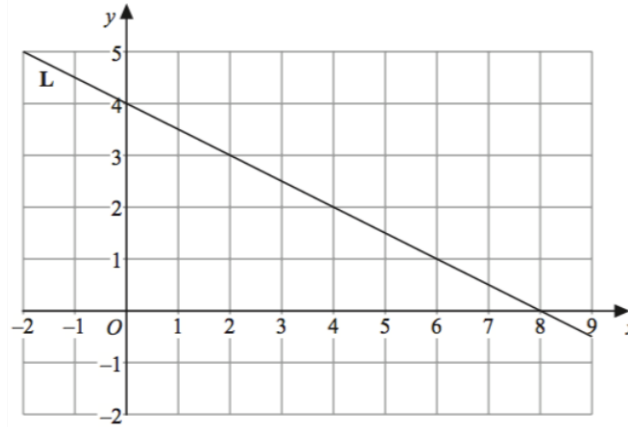
What is the equation of this straight line?

$y = 5x + 10$

Securing grade 5 – Algebra - Graphs

The points (0, –1) and (4, 5) lie on the straight line **L**.
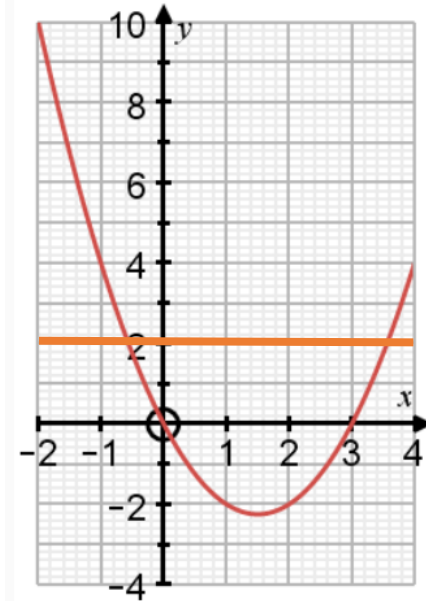

Write down an equation of **L**.

$$L = \frac{3}{2}x - 1$$

Find the equation of the line **L**.

$$L = \frac{-1}{2}x + 4$$

The graph of $y = x^2 - 3x$ is drawn below.

Use the graph to solve the equation $x^2 - 3x = 2$

$$x = 3.6$$
$$x = -0.6$$