

N5

UNIT 1



Past Paper Assessment Revision
National 5 Mathematics
Unit 1

PERCENTAGES

There are 2.69 million vehicles in Scotland.

It is estimated that this number will increase at a rate of 4% each year.

If this estimate is correct, how many vehicles will there be in 3 years' time?

Give your answer **correct to 3 significant figures**.

A company makes large bags of crisps which contain 90 grams of fat.

The company aims to reduce the fat content of the crisps by 50%.

They decide to reduce the fat content by 20% each year.

Will they have achieved their aim by the end of the 3rd year?

Justify your answer.

A company buys machinery worth £750 000.

The value of the machinery depreciates by 20% per annum.

The machinery will be replaced at the end of the year in which its value falls below half of its original value.

After how many years should the machinery be replaced?

You must explain your answer.

Last year, 1296 learner drivers from "Topflight" school of motoring passed their driving test.

This was 72% of those who sat their driving test from Topflight.

How many **failed** their driving test?

A car is valued at £3780.

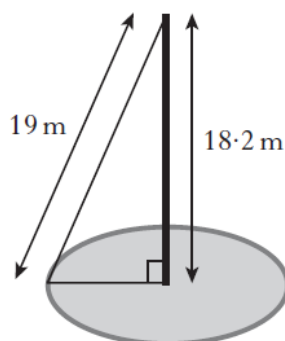
This is 16% less than last year's value.

What was the value of the car last year?

PYTHAGORAS

A mobile phone mast, 18.2 metres high, stands vertically in the centre of a circle.

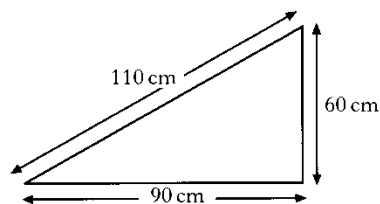
It is supported by a wire rope, 19 metres long, attached to the ground at a point on the circumference of the circle, as shown.



Calculate the circumference of the circle.

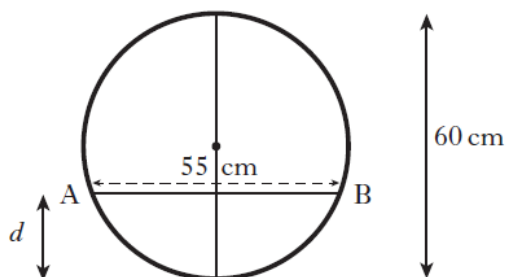
A triangular paving slab has measurements as shown.

Is the slab in the shape of a right angled triangle?



Water flows through a horizontal pipe of diameter 60 centimetres.

The surface width, AB , of the water is 55 centimetres.



(a) Calculate the depth, d , of the water in the pipe.

(b) What other depth of water would give the same surface width?

REMOVING BRACKETS

Expand and simplify

$$(2x - 5)(x^2 + 3x - 7).$$

Expand and simplify

$$(3x - 2)(2x^2 + x + 5).$$

Expand and simplify

$$(3x + 1)(x^2 - 5x + 4).$$

Expand fully and simplify

$$x(x - 1)^2.$$

Expand and simplify

$$(2x - 1)(x + 4).$$

Remove brackets and simplify

$$(2x + 3)^2 - 3(x^2 - 6).$$

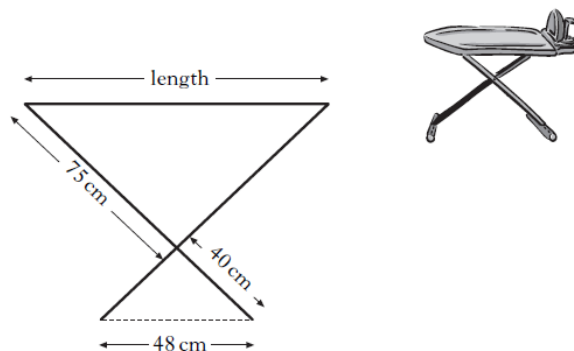
Multiply out the brackets and collect like terms.

$$(x + 2)(x - 5) - 9x$$

SMILARITY

Mick needs an ironing board.

He sees one in a catalogue with measurements as shown in the diagram below.



When the ironing board is set up, two similar triangles are formed.

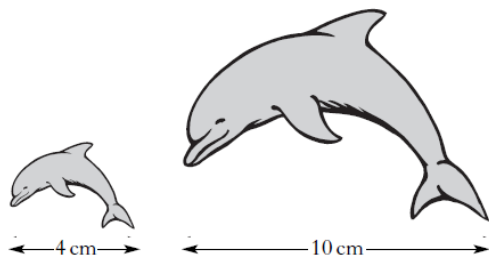
Mick wants an ironing board which is at least 80 centimetres in length.

Does this ironing board meet Mick's requirements?

Show all your working.

Two fridge magnets are mathematically similar.

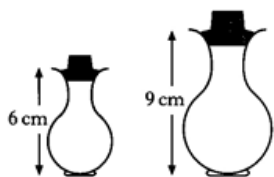
One magnet is 4 centimetres long and the other is 10 centimetres long.



The area of the smaller magnet is 18 square centimetres.

Calculate the area of the larger magnet.

Two perfume bottles are mathematically similar in shape.



The smaller one is 6 centimetres high and holds 30 millilitres of perfume.

The larger one is 9 centimetres high.

What volume of perfume will the larger one hold?

FACTORISING

Factorise

$$x^2 - 4y^2.$$

Factorise

$$4x^2 - y^2.$$

Factorise fully

$$5x^2 - 45.$$

Factorise

$$x^2 + x - 6.$$

Given that

$$x^2 - 10x + 18 = (x - a)^2 + b,$$

find the values of a and b .