



# Maths Points

Junior and Leaving Cert

## JCOL BASIC SKILLS PACK 2

JUNIOR CERT ORDINARY LEVEL





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# Maths Points

Junior and Leaving Cert

Solve the equation  $x^2 - 3x - 10 = 0$ .

Factorise the quadratic and let equal bracket equal 0.

$$x^2 - 3x - 10 = 0$$

$$(x - 5)(x + 2) = 0$$

$$x - 5 = 0$$

$$x = 5$$

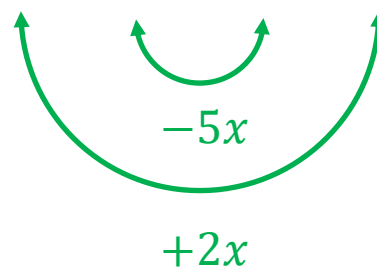
$$x + 2 = 0$$

$$x = -2$$

Trial and Error Approach

$$x^2 - 3x - 10$$

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



$$\begin{array}{r} 10 \\ 10 \quad 1 \\ \hline 5 \quad 2 \end{array}$$

$$-5x$$

$$+2x$$

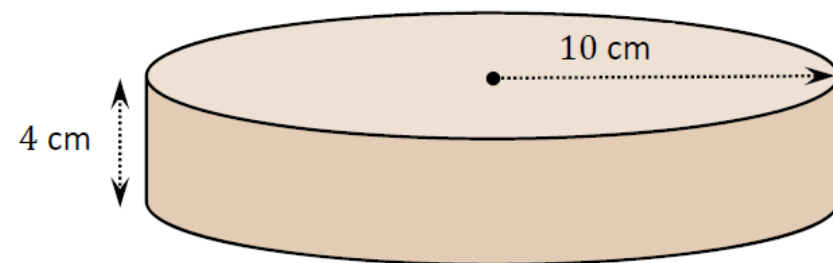
$$-3x$$

Tom also bakes a cake.

His cake tin is in the shape of a cylinder.

It has the dimensions shown in the diagram below.

Work out the **volume** of Tom's cake tin. Give your answer in terms of  $\pi$ .



**Volume of Cylinder**

$$V = \pi r^2 h$$

$$r = 10$$

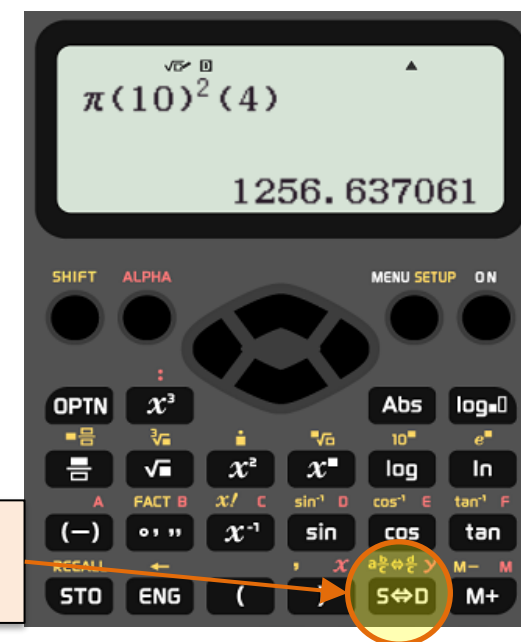
$$h = 4$$

$$V = \pi r^2 h$$

$$V = \pi(10)^2(4)$$

$$V = 400\pi \text{ cm}^3$$

← In terms of  $\pi$



For the answer as a decimal.

The formula for the Volume of a **Cylinder** can be found on page 10 of the Maths Formulae Book.

Draw the graph of the function

$$f(x) = x^2 - x - 2$$

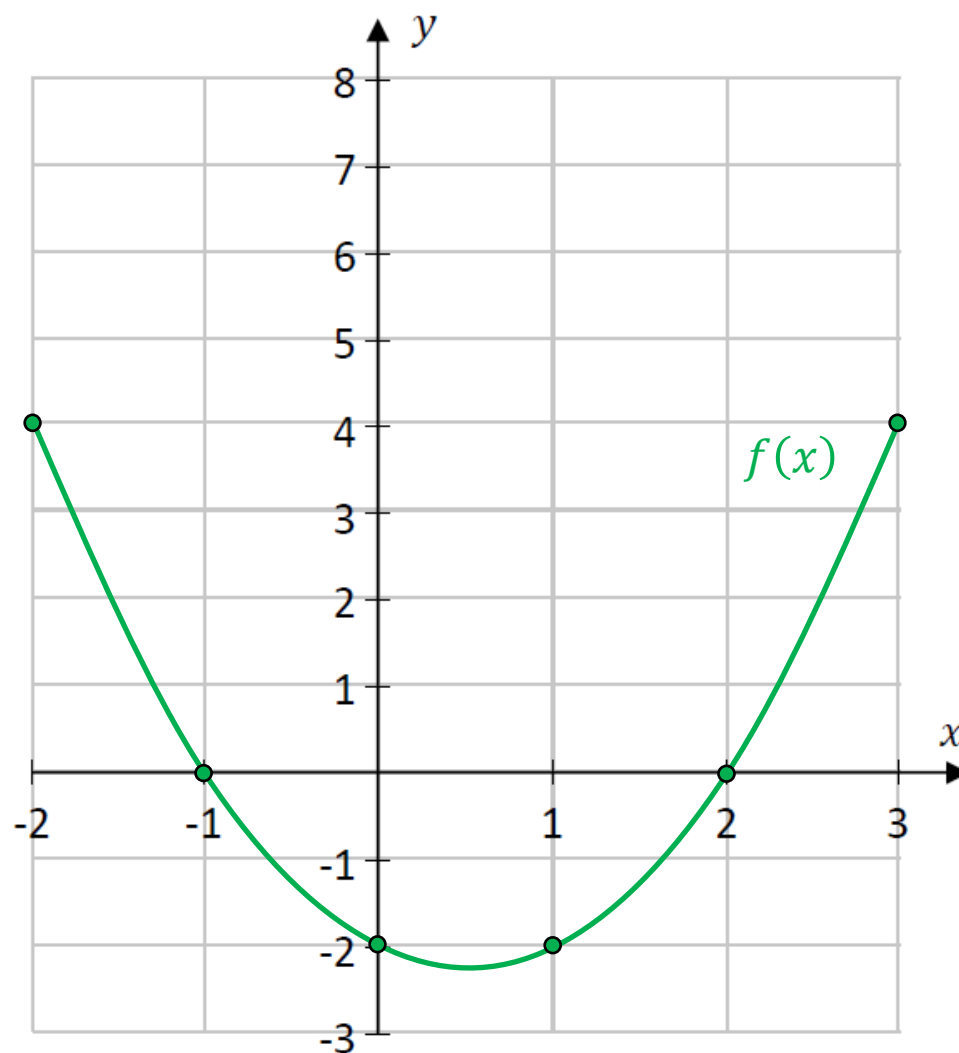
on the axes below, for  $-2 \leq x \leq 3$ ,  $x \in \mathbb{R}$ .

This is a quadratic function so we need to find a number of the points in the domain for greater accuracy.

Always fill out a table.

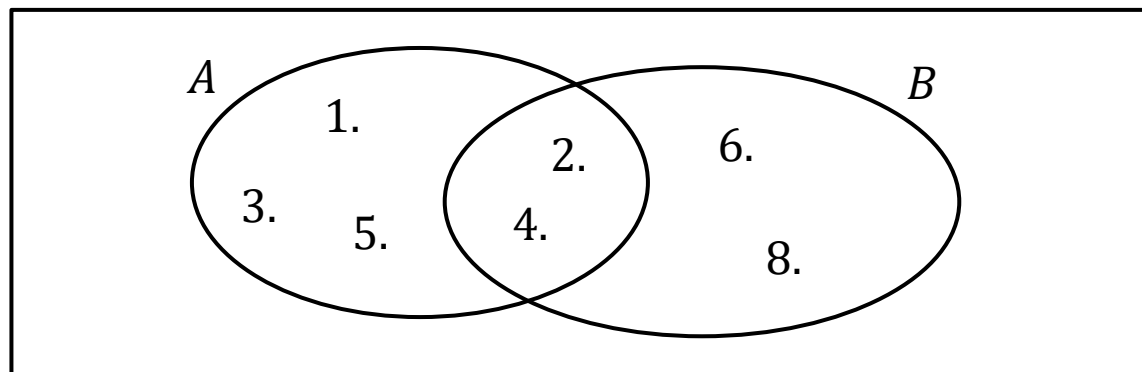
$x$	$y = x^2 - x - 2$	$y$	$(x, y)$
-2	$(-2)^2 - (-2) - 2$	4	$(-2, 4)$
-1	$(-1)^2 - (-1) - 2$	0	$(-1, 0)$
0	$(0)^2 - (0) - 2$	-2	$(0, -2)$
1	$(1)^2 - (1) - 2$	-2	$(1, -2)$
2	$(2)^2 - (2) - 2$	0	$(2, 0)$
3	$(3)^2 - (3) - 2$	4	$(3, 4)$

... always check solution by using table mode of the calculator!



$$A = \{1, 2, 3, 4, 5\} \quad B = \{2, 4, 6, 8\}$$

Fill the elements of  $A$  and  $B$  into the following Venn diagram:



$$A = \{1, 2, 3, 4, 5\}$$

$$B = \{2, 4, 6, 8\}$$

### Bonus

Hence list the elements of

- (i)  $(A \cup B)$   
 (ii)  $(A \cap B)$

### Symbols:

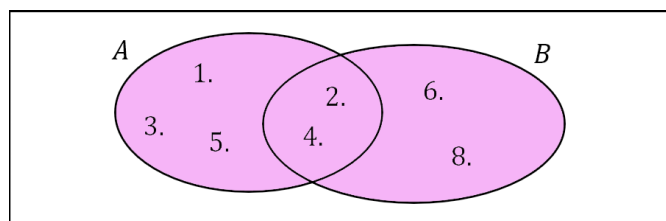
$\cup$  Union

$\cap$  Intersection

$$(A \cup B)$$

List all the elements  
in  $A$  and in  $B$ .

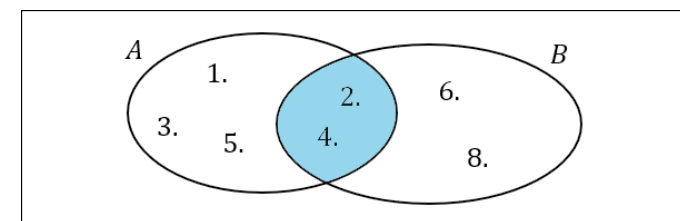
$$(A \cup B) = \{1, 2, 3, 4, 5, 6, 8\}$$



$$(A \cap B)$$

List the elements that  
are common to  $A$  and  $B$ .

$$(A \cap B) = \{2, 4\}$$



In a survey, 1500 people were asked which national radio station they normally listen to. The results of the survey are given in the table below.

How many of the people surveyed do not listen to a national radio station?

	RTE1	Today FM	Newstalk	Lyric FM	2FM	No national station
Frequency	375	195	120	45	165	600
Relative frequency (as a fraction)	$\frac{375}{1500}$					
Relative frequency (as a decimal)			0.08			

Subtract the sum of the frequencies for the other numbers from 1500.

$$1500 - (375 + 195 + 120 + 45 + 165) = 600$$

RTE  
RADIO 1

TODAY fm

NT

RTE  
lyric fm

RTE  
Continued

Complete the table.

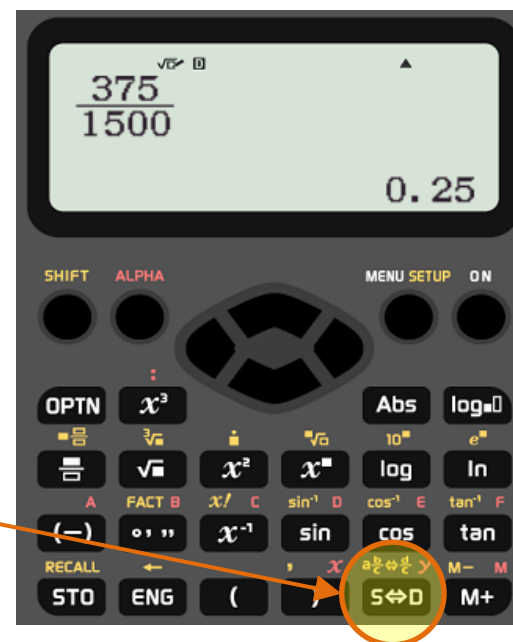
	RTE1	Today FM	Newstalk	Lyric FM	2FM	No national station
<b>Frequency</b>	375	195	120	45	165	600
<b>Relative frequency (as a fraction)</b>	$\frac{375}{1500}$	$\frac{195}{1500}$	$\frac{120}{1500}$	$\frac{45}{1500}$	$\frac{165}{1500}$	$\frac{600}{1500}$
<b>Relative frequency (as a decimal)</b>	0.25	0.13	0.08	0.13	0.03	0.40

### Relative Frequency

$$= \frac{\text{number of times the event happens in a trial}}{\text{total number of trials}}$$

Divide each of the frequencies by the total number of people surveyed, 1500.

To convert to a decimal, we can press the **S ↔ D** button on the calculator.



RTE  
RADIO 1

TODAY fm

NT

RTE  
lyric fm

Continued



Find the sum of the relative frequencies written as fractions.



	RTE1	Today FM	Newstalk	Lyric FM	2FM	No national station
Frequency	375	195	120	45	165	600
Relative frequency (as a fraction)	$\frac{375}{1500}$	$\frac{195}{1500}$	$\frac{120}{1500}$	$\frac{45}{1500}$	$\frac{165}{1500}$	$\frac{600}{1500}$
Relative frequency (as a decimal)	0.25	0.13	0.08	0.13	0.03	0.40

$$\frac{1500}{1500} = 1$$

(d)

Find the sum of the relative frequencies written as decimals.

	RTE1	Today FM	Newstalk	Lyric FM	2FM	No national station
Frequency	375	195	120	45	165	600
Relative frequency (as a fraction)	$\frac{375}{1500}$	$\frac{195}{1500}$	$\frac{120}{1500}$	$\frac{45}{1500}$	$\frac{165}{1500}$	$\frac{600}{1500}$
Relative frequency (as a decimal)	0.25	0.13	0.08	0.13	0.03	0.40

$$1$$



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