

**Pearson Edexcel**

**Level 1/Level 2**

**GCSE (9-1) in Mathematics (1MA1)**



# **A Teacher's Guide To Command Words**

## Introduction

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This document provides some guidance around the use of command words in GCSE (9–1) Mathematics. This includes a table of command words with some commentary around what is expected from students when this command word is used and a few examples of exam questions to exemplify its use.

Where useful, examples have been used to further exemplify the use of the command word.

*Please note that the command word table does not include an exhaustive list but uses the most commonly used command words.*

**Note:** once you have clicked on an example from the main command words table on page 3, click the [Return to command word table](#) link to then return to the command words table.

## GCSE Maths – Command words table – Teacher guide

Please note that this table is not exhaustive but uses the most commonly used command words.

Command words		What you need to know	Examples
1	<b>Calculate</b>	A calculator and some working will be needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
2	<b>Change</b>	Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
3	<b>Complete</b>	Fill in missing values. For example, on a probability tree diagram or a table of values.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
4	<b>Describe</b>	Write a sentence that gives the features of the situation. For example, describing a transformation or trend in a graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
5	<b>Draw</b>	Produce an accurate drawing (unless a sketch is being drawn). For example, draw a graph, draw an accurate elevation of a pyramid.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
6	<b>Draw a sketch of... Sketch</b>	Produce a drawing that does not have to be drawn to scale <b>or</b> a graph that is drawn without working out each coordinate. For example, sketch a graph, sketch a cylinder.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
7	<b>Expand</b>	Remove brackets.	<a href="#">Example 1</a>
8	<b>Expand and simplify</b>	Remove brackets and the collect like terms.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
9	<b>Explain</b>	Write a sentence or a mathematical statement to show how you got to your answer or reached your conclusion.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
10	<b>Express</b>	Re-write in another form, some working may be needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 2</a>
11	<b>Factorise</b>	Insert brackets by taking out common factors.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

Command words		What you need to know	Examples
12	<b>Factorise fully</b>	Insert brackets by taking out <b>all</b> the common factors.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
13	<b>Find</b>	Some working will be needed to get to the final answer.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
14	<b>Give a reason</b>	Must be clear and accurate reasons. If the reasons are geometrical then make sure you: - provide a reason for each stage of working (if required), - use correct geometric terminology.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
15	<b>Justify</b>	Show all working and/or give a written explanation.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
16	<b>Prove</b>	More formal than 'show', all steps must be present. In the case of a geometrical proof, reasons must be given.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
17	<b>Prove algebraically</b>	Use algebra in the proof.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
18	<b>Show</b>	All working needed to get to a given answer <b>or</b> complete a diagram to show given information.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
19	<b>Simplify</b>	Simplify the given expression	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
20	<b>Simplify fully</b>	Simplify the given expression. Answer must be given in its simplest form.	<a href="#">Example 1</a> <a href="#">Example 2</a>
21	<b>Solve</b>	Find the solution of an equation or inequality.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
22	<b>Solve algebraically</b>	Find the solution of an equation or inequality; algebraic manipulation <b>must</b> be shown.	<a href="#">Example 1</a> <a href="#">Example 2</a>
23	<b>Write down</b>	No working is needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
24	<b>Write</b>	No working needed for 1 mark questions. Working may be needed questions with more than 1 mark.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
25	<b>Work out</b>	Some working will be needed in order to get the answer.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

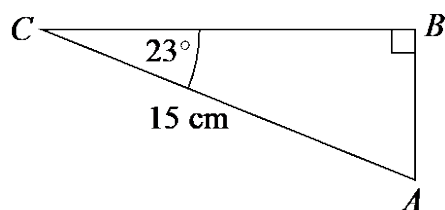
## GCSE Maths – Command Words – Teacher guide

Command words		What you need to know	Examples
1	Calculate	A calculator and some working will be needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Calculate - Example 1 June 2017 – Paper 3H

[Return to command word table](#)

- 7  $ABC$  is a right-angled triangle.

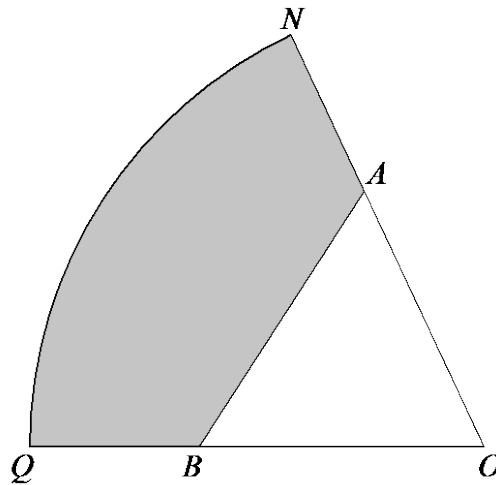


Calculate the length of  $AB$ .  
Give your answer correct to 3 significant figures.

.....cm

(Total for Question 7 is 2 marks)

17



$ONQ$  is a sector of a circle with centre  $O$  and radius 11 cm.

$A$  is the point on  $ON$  and  $B$  is the point on  $OQ$  such that  $AOB$  is an equilateral triangle of side 7 cm.

Calculate the area of the shaded region as a percentage of the area of the sector  $ONQ$ .  
Give your answer correct to 1 decimal place.

.....%

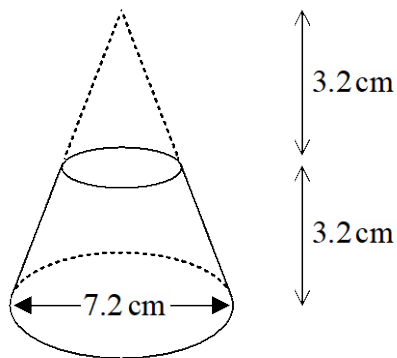
**(Total for Question 17 is 5 marks)**

### Calculate - Example 3

Nov 2018 – Paper 2H

[Return to command word table](#)

20 Here is a frustum of a cone.

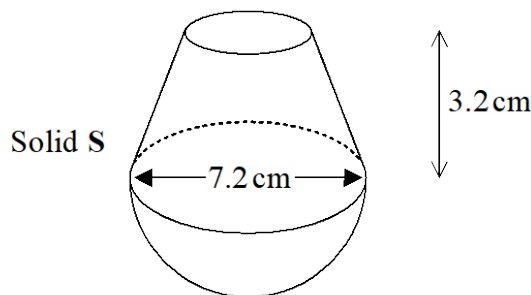


Volume of sphere =  $\frac{4}{3} \pi r^3$

Volume of cone =  $\frac{1}{3} \pi r^2 h$

The diagram shows that the frustum is made by removing a cone with height 3.2 cm from a solid cone with height 6.4 cm and base diameter 7.2 cm.

The frustum is joined to a solid hemisphere of diameter 7.2 cm to form the solid S shown below.



The density of the frustum is  $2.4 \text{ g/cm}^3$   
 The density of the hemisphere is  $4.8 \text{ g/cm}^3$   
 Calculate the average density of solid S.

.....g/cm<sup>3</sup>

(Total for Question 20 is 5 marks)

Command words		What you need to know	Examples
2	Change	Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Change - Example 1**  
**June 2018 – Paper 2F**

[Return to command word table](#)

- 5 (a) Change 35 cm to mm.

..... mm  
(1)

- (b) Change 7700 millilitres to litres.

..... litres  
(1)

- (c) Change 0.32 kilograms to grams.

..... grams  
(1)

**(Total for Question 5 is 3 marks)**

**Change - Example 2**  
**Nov 2018 – Paper 1F**

[Return to command word table](#)

- 1 (a) Change 365 cm into metres.

..... m  
(1)

- (b) Change 2.7 kg into grams.

..... g  
(1)

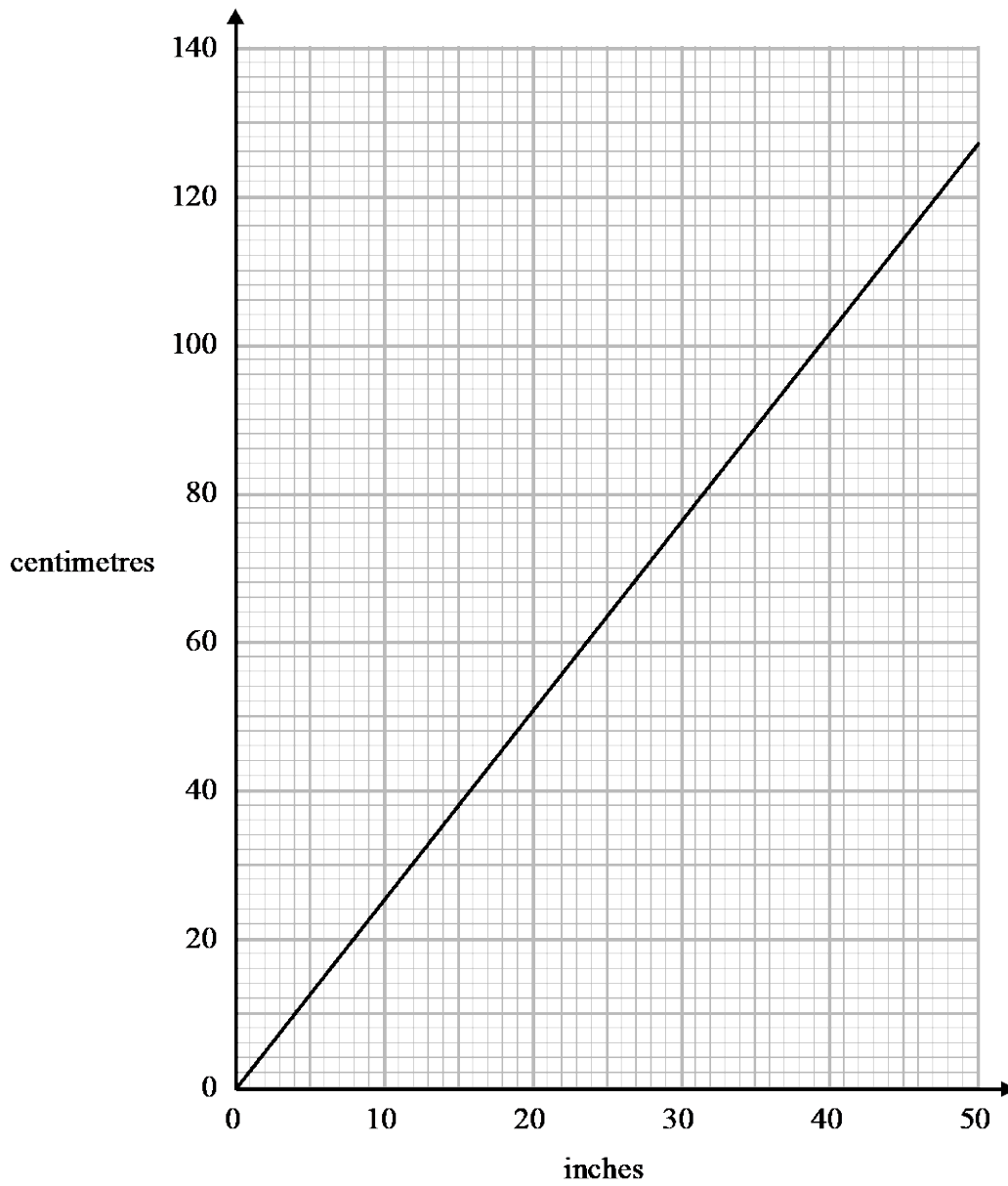
**(Total for Question 1 is 2 marks)**



**Change - Example 3**  
**June 2017 – Paper 2F**

[Return to command word table](#)

- 11 You can use this graph to change between inches and centimetres.



- (a) Change 74 cm to inches.

..... inches  
(1)

Command words		What you need to know	Examples
3	Complete	Fill in missing values. For example, on a probability tree diagram or a table of values.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

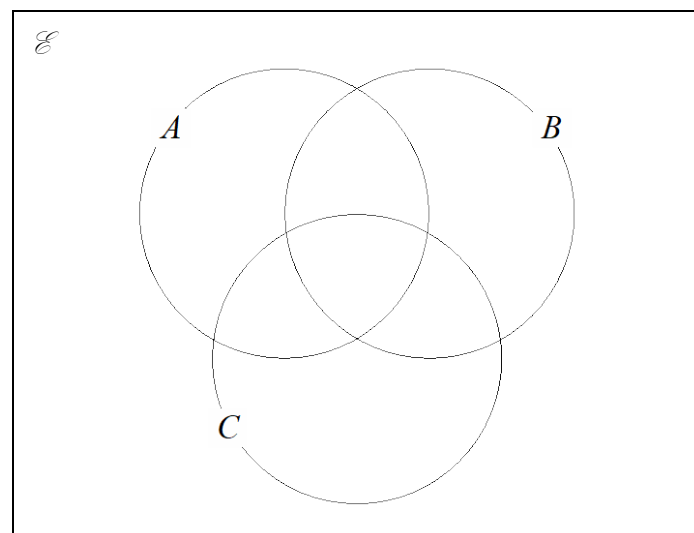
### Complete - Example 1

[Return to command word table](#)

Nov 2018 – Paper 2H

- 1  $\mathcal{E} = \{\text{even numbers between 1 and 25}\}$   
 $A = \{2, 8, 10, 14\}$   
 $B = \{6, 8, 20\}$   
 $C = \{8, 18, 20, 22\}$

(a) Complete the Venn diagram for this information.



(4)

### Complete - Example 2

[Return to command word table](#)

Nov 2018 – 3H

- 3 (a) Complete this table of values for  $y = x^2 + x - 4$

$x$	-3	-2	-1	0	1	2	3
$y$		-2	-4		-2		

(2)

### Complete - Example 3

[Return to command word table](#)

Nov 2017 – Paper 2F

5 60 students were asked how they get to school.

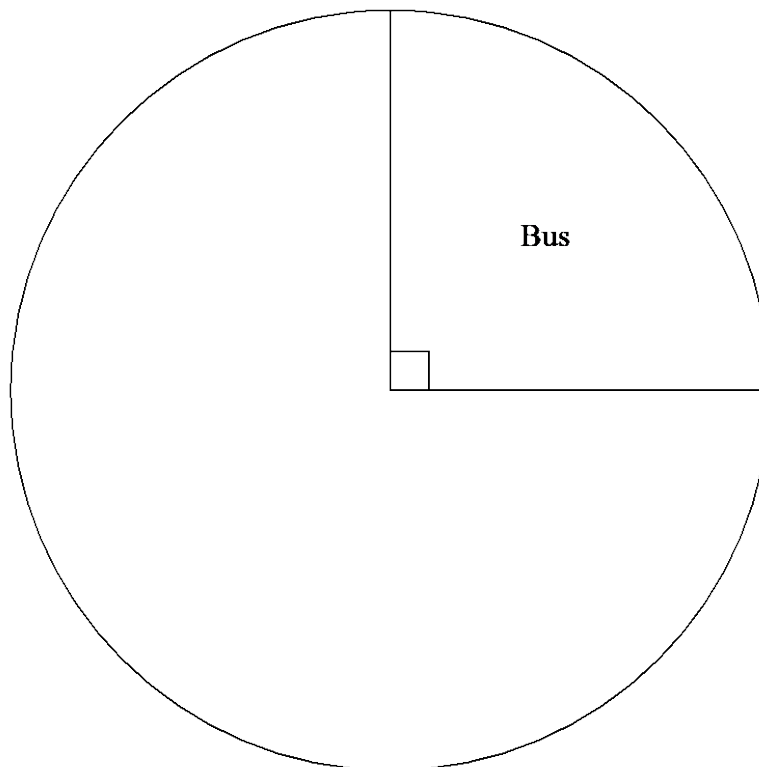
The table shows the results.

	Bus	Walk	Car	Bicycle
Number of students	15	27	12	6

(a) What fraction of the 60 students did **not** walk to school?

.....  
(2)

(b) Complete the pie chart for the information in the table.



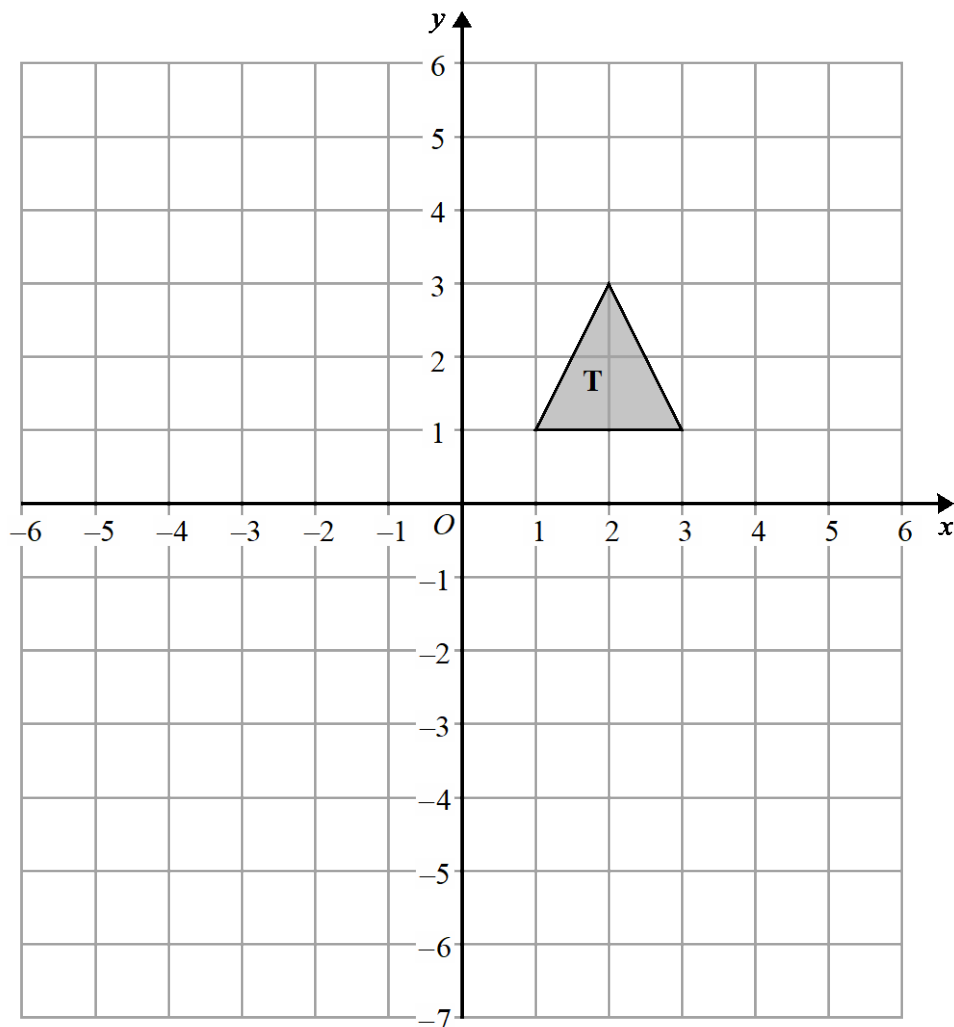
(4)

Command words		What you need to know	Examples
4	Describe	Write a sentence that gives the features of the situation. For example, describing a transformation or trend in a graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Describe - Example 1**  
**June 2018 – Paper 1H**

[Return to command word table](#)

7



Shape **T** is reflected in the line  $x = -1$  to give shape **R**.  
Shape **R** is reflected in the line  $y = -2$  to give shape **S**.

Describe the **single** transformation that will map shape **T** to shape **S**.

.....

.....

**(Total for Question 7 is 2 marks)**

**Describe - Example 2**  
**June 2018 – Paper 1F**

[Return to command word table](#)

- 18**  $A = \{\text{multiples of 5 between 14 and 26}\}$   
 $B = \{\text{odd numbers between 14 and 26}\}$

(a) List the members of  $A \cup B$

.....  
(2)

(b) Describe the members of  $A \cap B$

.....  
(1)

**(Total for Question 18 is 3 marks)**

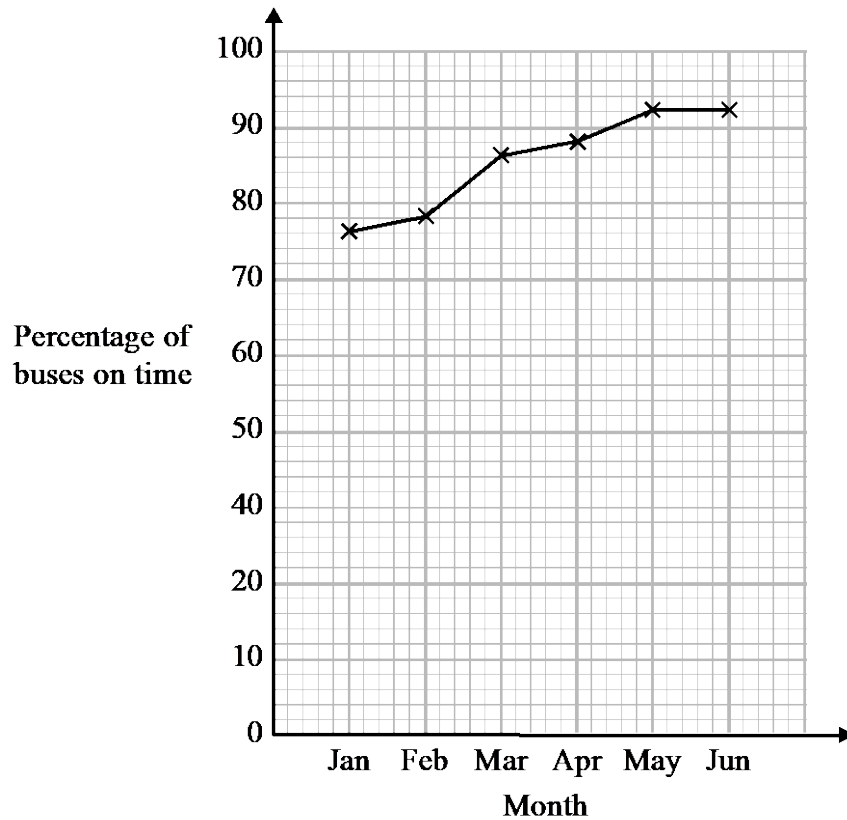
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### Describe - Example 3

[Return to command word table](#)

Nov 2017 – Paper 2F

- 8 Chrissy drew this graph to show the percentage of buses that got to a bus stop on time for six months.



- (a) Write down **one** thing that is wrong with the graph.

.....  
.....  
(1)

- (b) Describe the trend in the percentage of buses that got to the bus stop on time.

.....  
(1)

**(Total for Question 8 is 2 marks)**

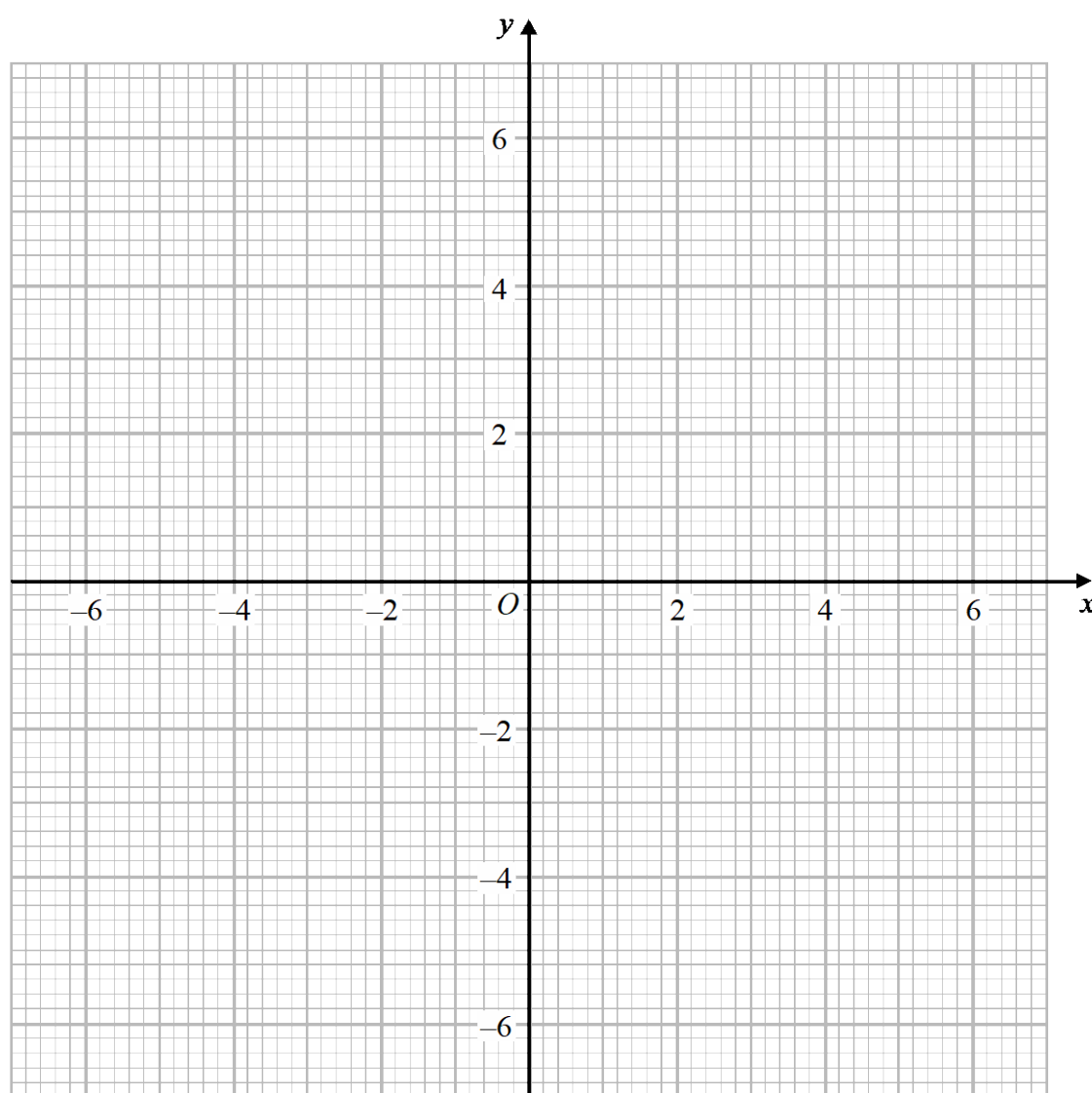
Command words		What you need to know	Examples
5	Draw	Produce an accurate drawing (unless a sketch is being drawn). For example, draw a graph, draw an accurate elevation of a pyramid.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Draw - Example 1

[Return to command word table](#)

June 2018 – Paper 2H

- 16 (a) On the grid, draw the graph of  $x^2 + y^2 = 12.25$



(2)

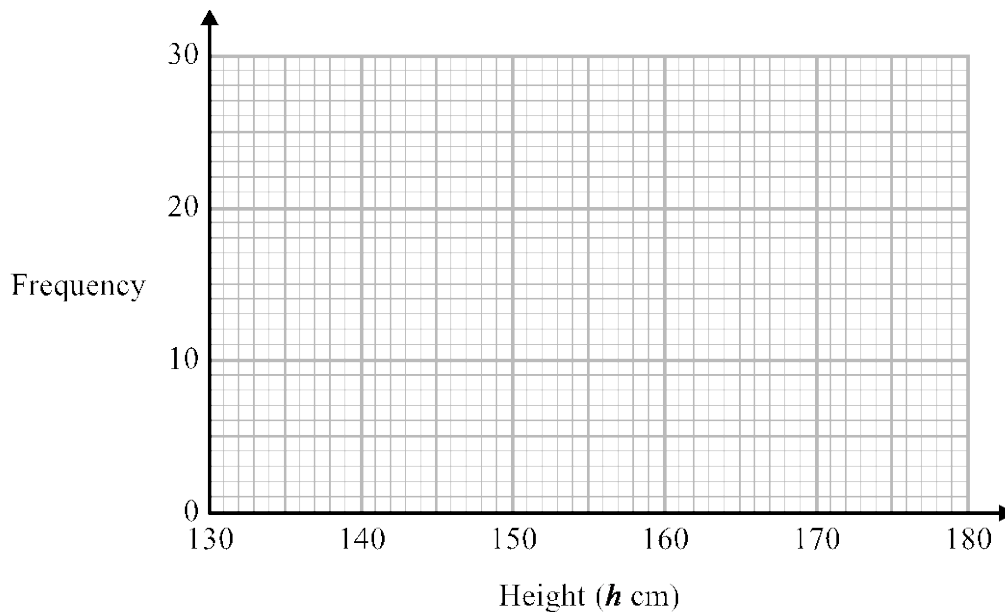
19 The table shows information about the heights of 80 children.

Height ( $h$ cm)	Frequency
$130 < h \leq 140$	4
$140 < h \leq 150$	11
$150 < h \leq 160$	24
$160 < h \leq 170$	22
$170 < h \leq 180$	19

(a) Find the class interval that contains the median.

.....  
(1)

(b) Draw a frequency polygon for the information in the table.



(2)

**(Total for Question 19 is 3 marks)**

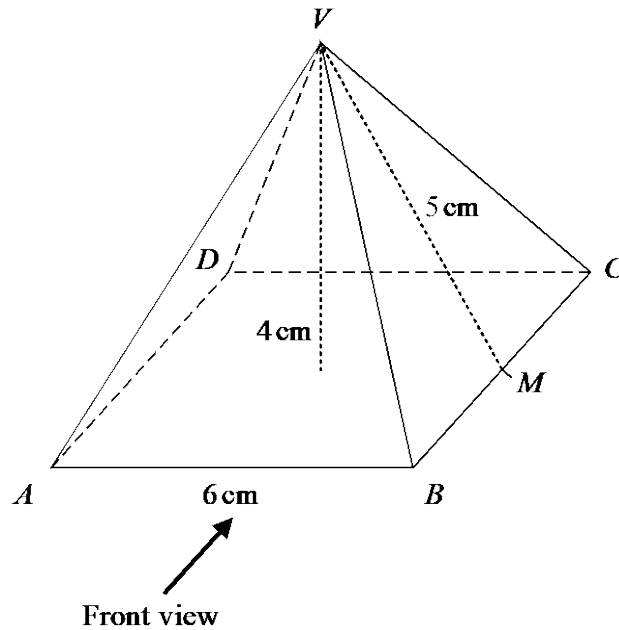


### Draw - Example 3

[Return to command word table](#)

June 2018 – Paper 1F

- 23 Here is a solid square-based pyramid,  $VABCD$ .



The base of the pyramid is a square of side 6 cm.

The height of the pyramid is 4 cm.

$M$  is the midpoint of  $BC$  and  $VM = 5$  cm.

- (a) Draw an accurate front elevation of the pyramid from the direction of the arrow.



(2)

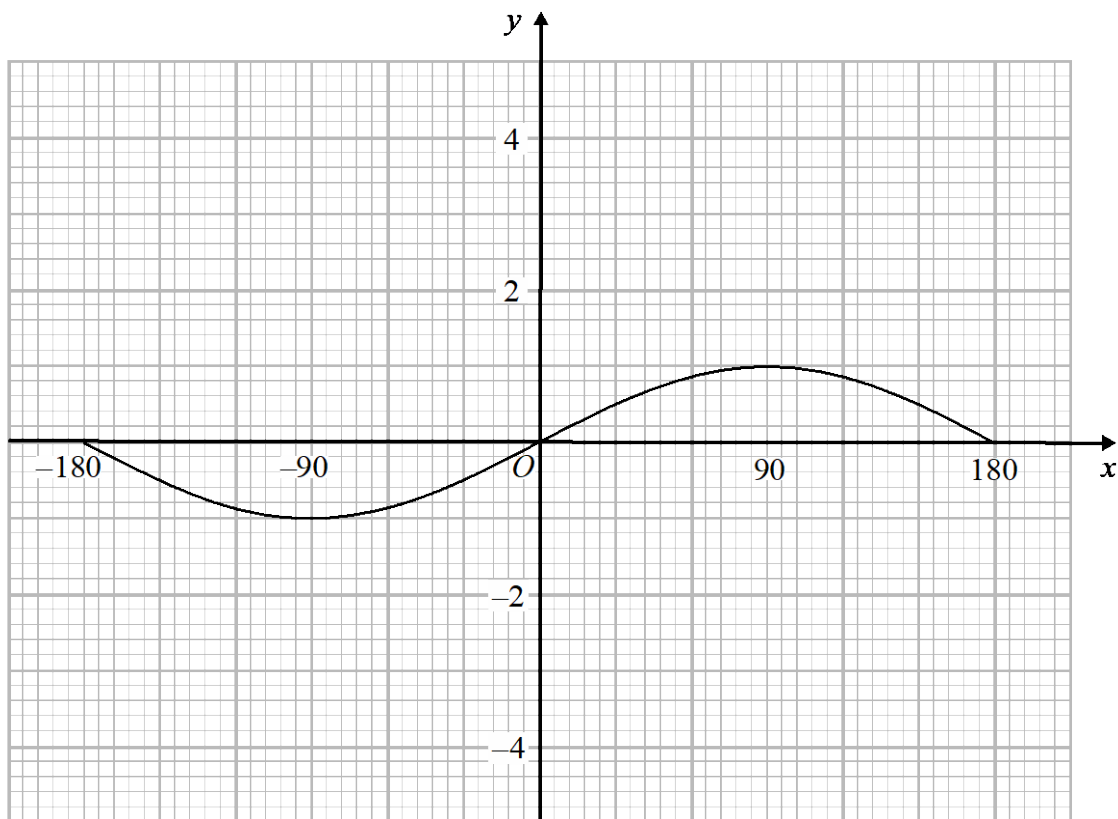
Command words		What you need to know	Examples
6	<p><b>Draw a sketch of...</b></p> <p><b>Sketch</b></p>	<p>Produce a drawing that does not have to be drawn to scale <b>or</b> a graph that is drawn without working out each coordinate.</p> <p style="border: 1px solid black; padding: 5px;">For example, sketch a graph, sketch a cylinder.</p>	<p><a href="#">Example 1</a></p> <p><a href="#">Example 2</a></p> <p><a href="#">Example 3</a></p>

### Sketch - Example 1

June 2018 - Paper 1H

[Return to command word table](#)

- 18 Here is the graph of  $y = \sin x^\circ$  for  $-180 \leq x \leq 180$



On the grid, sketch the graph of  $y = \sin x^\circ - 2$  for  $-180 \leq x \leq 180$

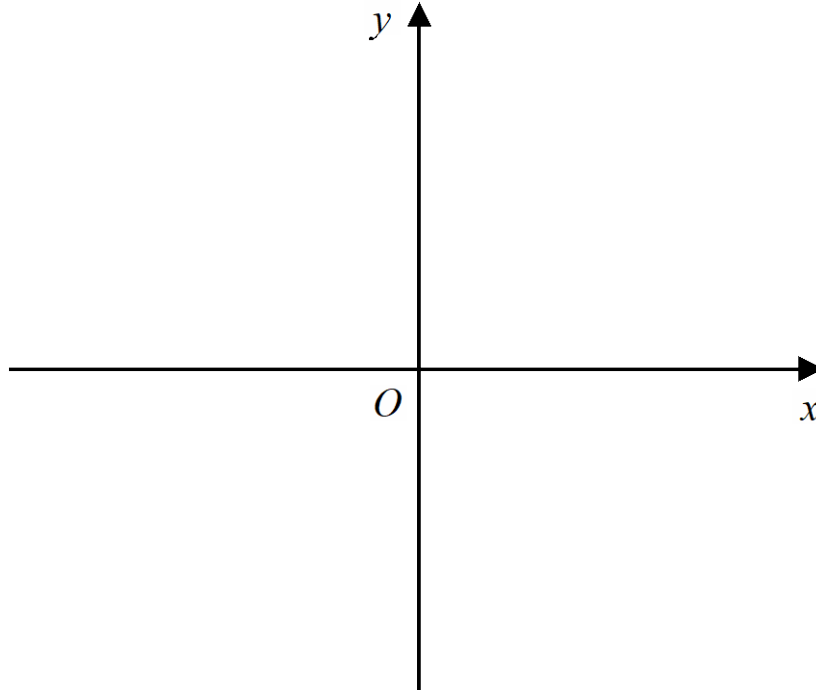
(Total for Question 18 is 2 marks)

## Sketch - Example 2

[Return to command word table](#)

**Nov 2018 - Paper 2H**

- 14 On the grid, sketch the curve with equation  $y = 2^x$   
Give the coordinates of any points of intersection with the axes.



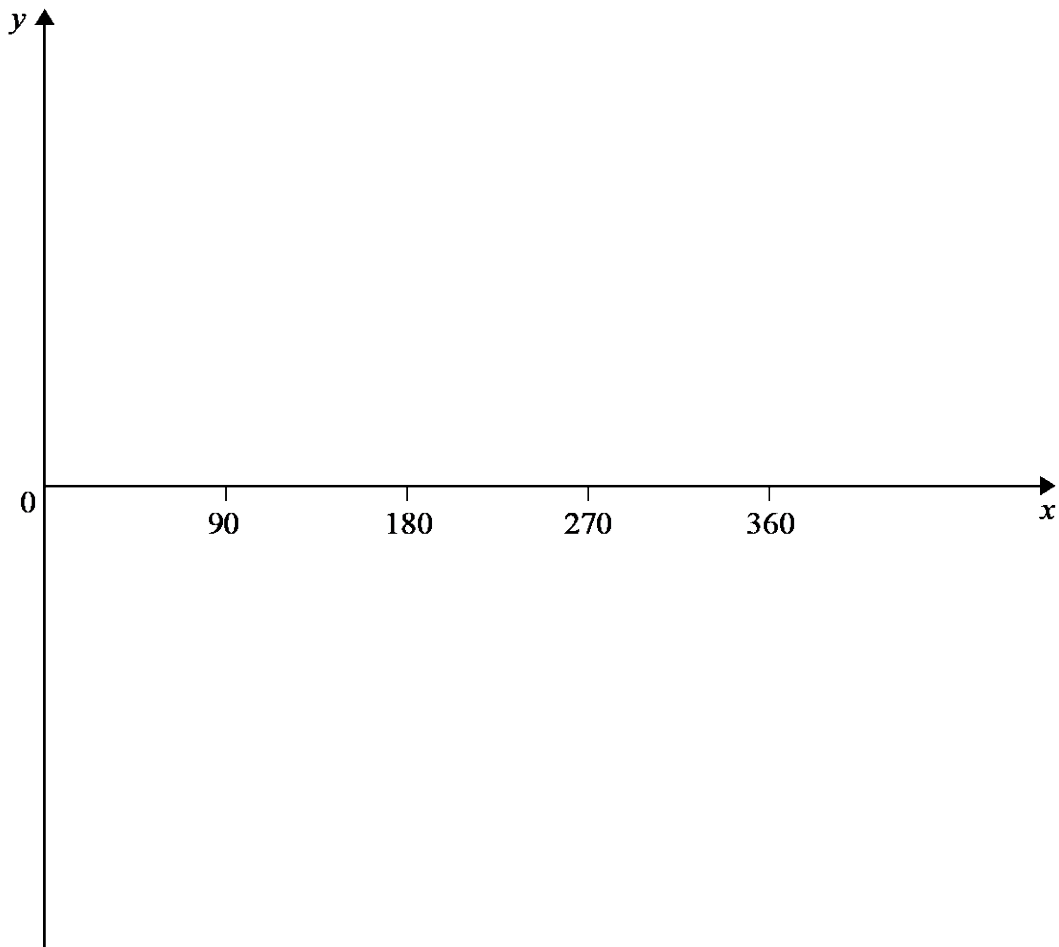
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(Total for Question 14 is 2 marks)

**Sketch - Example 3**  
**Nov 2018 - Paper 3H**

[Return to command word table](#)

- 11 Sketch the graph of  $y = \tan x^\circ$  for  $0 \leq x \leq 360$



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(Total for Question 11 is 2 marks)

Command words		What you need to know	Examples
7	Expand	Remove brackets.	<a href="#">Example 1</a>

### Expand - Example 1

[Return to command word table](#)

#### June 2018 – Paper 1F

16(b) Expand  $4e(e + 2)$

.....  
(2)

Command words		What you need to know	Examples
8	Expand and simplify	Remove brackets and the collect like terms.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Expand and simplify - Example 1

[Return to command word table](#)

#### June 2018 – Paper 3H

2 Expand and simplify  $5(p + 3) - 2(1 - 2p)$

.....  
(2)

### Expand and simplify - Example 2

[Return to command word table](#)

#### Nov 2018 – Paper 2F

26 (a) Expand and simplify  $(5x + 2)(2x - 3)$

.....  
(2)

### Expand and simplify – Example 3

[Return to command word table](#)

#### Nov 2018 – Paper 3H

9 (a) Expand and simplify  $(x - 2)(2x + 3)(x + 1)$

.....  
(3)

Command words		What you need to know	Examples
9	<b>Explain</b>	Write a sentence or a mathematical statement to show how you got to your answer or reached your conclusion.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Explain - Example 1

[Return to command word table](#)

**Nov 2018 – Paper 2F**

14 Victoria throws an ordinary fair 6-sided dice once.

She says,

“The probability of getting a 3 is half the probability of getting a 6”

(a) Is Victoria correct?

You must explain your answer.

.....

.....

**(1)**

Andy throws the dice twice.

He says,

“The probability of getting a 6 on both throws is  $\frac{2}{6}$ ”

(b) Is Andy correct?

You must explain your answer.

.....

.....

---

**(1)**

**Explain – Example 2**  
**June 2018 – Paper 3F**

[Return to command word table](#)

15 Jenny is asked to find the value of  $12 - 2 \times 4$

Here is her working.

$$12 - 2 \times 4 = 10 \times 4 = 40$$

Jenny's answer is wrong.

(a) Explain what Jenny has done wrong.

.....  
.....  
(1)

Rehan is asked to find the range of the numbers 3 1 8 7 5

Here is his working.

$$\text{Range} = 5 - 3 = 2$$

This is wrong.

(b) Explain why.

.....  
.....  
(1)

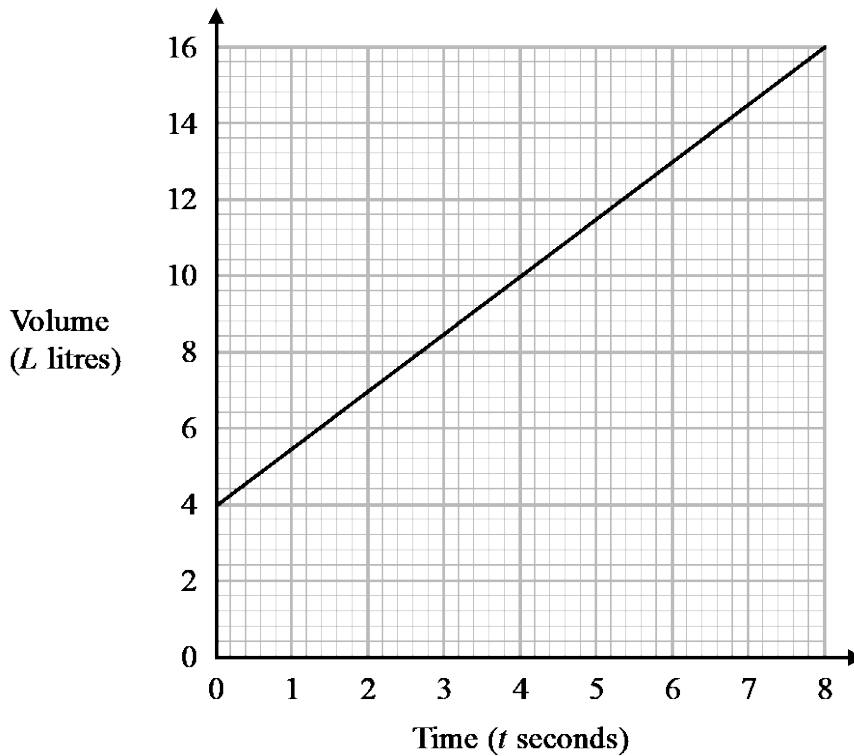
**(Total for Question 15 is 2 marks)**

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**Explain – Example 3**  
**June 2018 – Paper 3H**

[Return to command word table](#)

12 The graph shows the volume of liquid ( $L$  litres) in a container at time  $t$  seconds.



(a) Find the gradient of the graph.

.....  
(2)

(b) Explain what this gradient represents.

.....  
.....  
(1)

The graph intersects the volume axis at  $L = 4$

(c) Explain what this intercept represents.

.....  
.....  
(1)

**(Total for Question 12 is 4 marks)**



Command words		What you need to know	Examples
10	Express	Re-write in another form, some working may be needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 2</a>

### Express – Example 1

[Return to command word table](#)

Nov 2017 – Paper 2F

- 11 The table shows a cricket club’s income in 2016 from a fete, a quiz and membership fees.

	Income	
<b>Fete</b>	£250	
<b>Quiz</b>	Entry fees	13 at £5 each
	Refreshments	£35
<b>Membership fees</b>	25 at £20 each	

Express as a ratio

the income from the fete to the income from the quiz to the income from membership fees.

Give your ratio in its simplest form.

.....  
(Total for Question 11 is 3 marks)

### Express – Example 2

[Return to command word table](#)

June 2017 – Paper 1H

- 2 Express 56 as the product of its prime factors.

.....  
(Total for Question 2 is 2 marks)

**Express – Example 3**  
**Nov 2018 – Paper 2H**

[Return to command word table](#)

- 12 (b) Express  $\frac{3}{x+1} + \frac{1}{x-2} - \frac{4}{x}$  as a single fraction in its simplest form.

.....  
(3)

**(Total for Question 12 is 6 marks)**

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Command words		What you need to know	Examples
11	Factorise	Insert brackets by taking out common factors.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Factorise - Example 1

Nov 2017 – Paper 2F

[Return to command word table](#)

- 24 (c) Factorise  $x^2 + 6x + 9$

.....  
(1)

### Factorise - Example 2

June 2017 – Paper 2F

[Return to command word table](#)

- 14 (a) Factorise  $5 - 10m$

.....  
(1)

### Factorise - Example 3

Nov 2017 – Paper 3F

[Return to command word table](#)

- 17 (a) Factorise  $4m + 12$

.....  
(1)

Command words		What you need to know	Examples
12	Factorise fully	Insert brackets by taking out <b>all</b> the common factors.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Factorise fully - Example 1

[Return to command word table](#)

**Nov 2018- Paper 1H**

- 10 (b) Factorise fully  $50 - 2y^2$

.....  
(2)

### Factorise fully - Example 2

[Return to command word table](#)

**Nov 2018 – Paper 2F**

- 19 (b) Factorise fully  $9b - 3b^2$

.....  
(2)

### Factorise fully - Example 3

[Return to command word table](#)

**June 2017 – Paper 2F**

- 14 (b) Factorise fully  $2a^2b + 6ab^2$

.....  
(2)

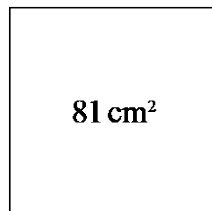
Command words		What you need to know	Examples
13	Find	Some working will be needed to get to the final answer.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Find - Example 1

Nov 2018 – Paper 2F

[Return to command word table](#)

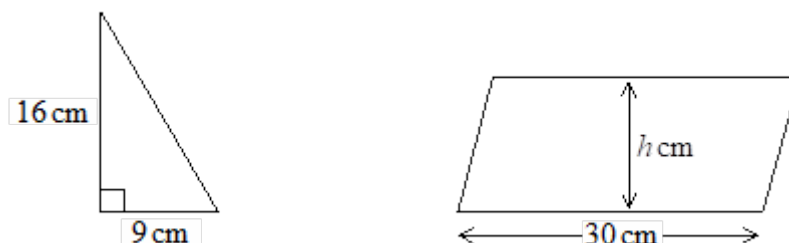
- 13 A square has an area of  $81 \text{ cm}^2$



- (a) Find the perimeter of the square.

.....cm  
(2)

The diagram shows a right-angled triangle and a parallelogram.



The area of the parallelogram is 5 times the area of the triangle.  
The perpendicular height of the parallelogram is  $h$  cm.

- (b) Find the value of  $h$ .

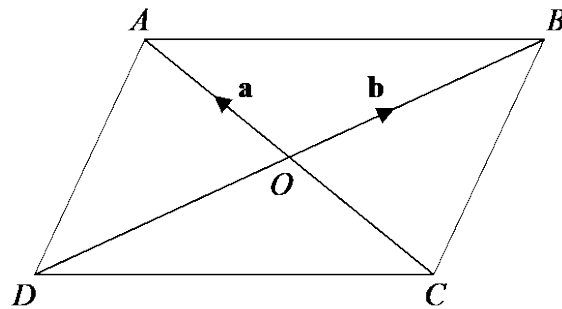
$h = \dots\dots\dots$   
(3)

(Total for Question 13 is 5 marks)

**Find - Example 2**  
**June 2017 – Paper 1F**

[Return to command word table](#)

27



*ABCD* is a parallelogram.  
The diagonals of the parallelogram intersect at *O*.

$$\vec{OA} = \mathbf{a} \text{ and } \vec{OB} = \mathbf{b}$$

(a) Find, in terms of  $\mathbf{b}$ , the vector  $\vec{DB}$ .

.....  
(1)

(b) Find, in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , the vector  $\vec{AB}$ .

.....  
(1)

(c) Find, in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , the vector  $\vec{AD}$ .

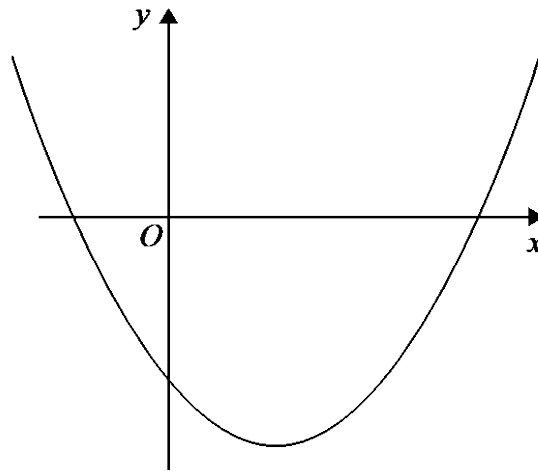
.....  
(1)

**(Total for Question 27 is 3 marks)**

**Find - Example 3**  
**Nov 2018 - Paper 1H**

[Return to command word table](#)

17 Here is a sketch of a curve.



The equation of the curve is  $y = x^2 + ax + b$  where  $a$  and  $b$  are integers.

The points  $(0, -5)$  and  $(5, 0)$  lie on the curve.

Find the coordinates of the turning point of the curve.

( ..... , ..... )

**(Total for Question 17 is 4 marks)**

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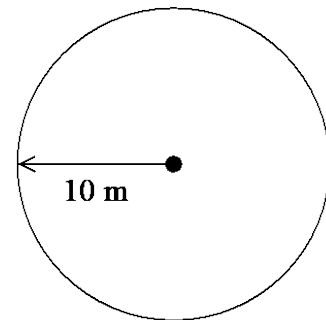
Command words		What you need to know	Examples
14	Give a reason	Must be clear and accurate reasons. If the reasons are geometrical then make sure you: - provide a reason for each stage of working (if required), - use correct geometric terminology.	<u><a href="#">Example 1</a></u> <u><a href="#">Example 2</a></u> <u><a href="#">Example 3</a></u>

### Give a reason - Example 1

[Return to command word table](#)

#### June 2017 – Paper 1F

- 18 Balena has a garden in the shape of a circle of radius 10 m. He is going to cover the garden with grass seed to make a lawn. Grass seed is sold in boxes. Each box of grass seed will cover 46 m<sup>2</sup> of garden. Balena wants to cover all the garden with grass seed.



- (a) Work out an estimate for the number of boxes of grass seed Balena needs. You must show your working.

.....  
(4)

- (b) Is your estimate for part (a) an underestimate or an overestimate? Give a reason for your answer.

.....  
 .....  
 .....  
 .....  
 .....  
 (1)

(Total for Question 18 is 5 marks)



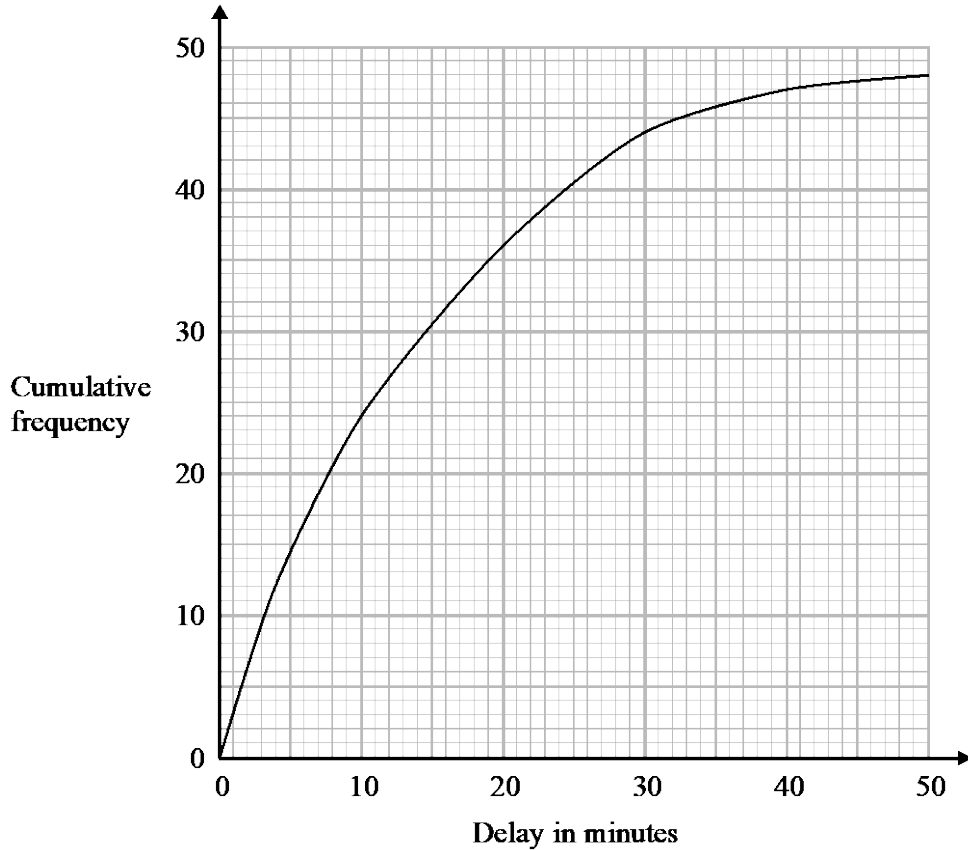
## Give a reason - Example 2

[Return to command word table](#)

Nov 2018- Paper 1H

- 9 The times that 48 trains left a station on Monday were recorded.

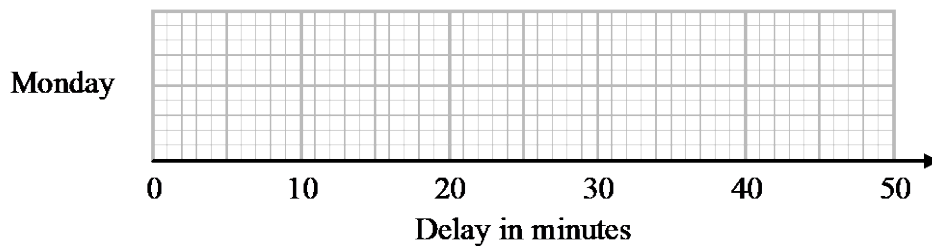
The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.



The shortest delay was 0 minutes.

The longest delay was 42 minutes.

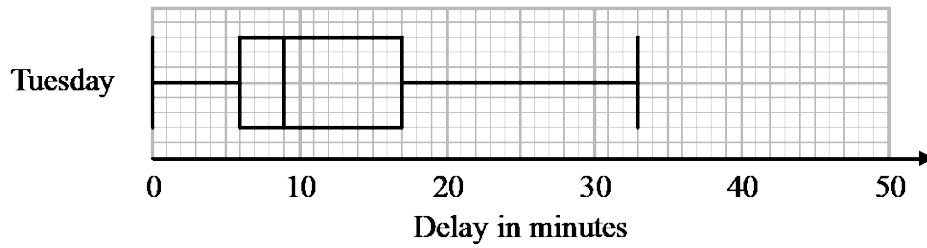
- (a) On the grid below, draw a box plot for the information about the delays on Monday.



(3)

48 trains left the station on Tuesday.

The box plot below gives information about the delays on Tuesday.



- (b) Compare the distribution of the delays on Monday with the distribution of the delays on Tuesday.

.....

.....

.....

.....

(2)

Mary says,

“The longest delay on Tuesday was 33 minutes.

This means that there must be some delays of between 25 minutes and 30 minutes.”

- (c) Is Mary right?

You must give a reason for your answer.

.....

.....

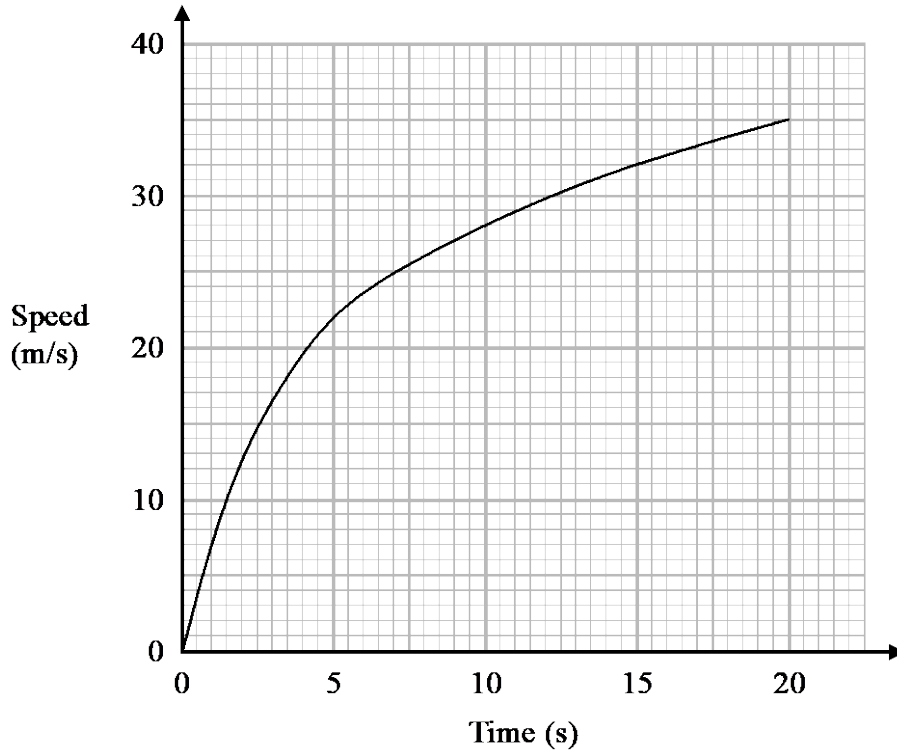
(1)

**(Total for Question 9 is 6 marks)**

**Give a reason - Example 3**  
**June 2018- Paper 3H**

[Return to command word table](#)

- 15 The graph shows the speed of a car, in metres per second, during the first 20 seconds of a journey.



- (a) Work out an estimate for the distance the car travelled in the first 20 seconds.  
 Use 4 strips of equal width.

..... metres  
 (3)

- (b) Is your answer to part (a) an underestimate or an overestimate of the actual distance the car travelled in the first 20 seconds?  
 Give a reason for your answer.

.....  
 .....  
 (1)

**(Total for Question 15 is 4 marks)**

Command words		What you need to know	Examples
15	Justify	Show all working and/or give a written explanation.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Justify - Example 1**  
**Nov 2017 – Paper 1H**

[Return to command word table](#)

- 5 The table shows information about the weekly earnings of 20 people who work in a shop.

Weekly earnings (£ $x$ )	Frequency
$150 < x \leq 250$	1
$250 < x \leq 350$	11
$350 < x \leq 450$	5
$450 < x \leq 550$	0
$550 < x \leq 650$	3

- (a) Work out an estimate for the mean of the weekly earnings.

£.....  
(3)

Nadiya says,

“The mean may **not** be the best average to use to represent this information.”

- (b) Do you agree with Nadiya?  
You must justify your answer.

.....  
.....  
(1)

(Total for Question 5 is 4 marks)

## Justify - Example 2

Nov 2017 – Paper 2F

[Return to command word table](#)

4 Ken buys some fruit.

He buys apples, bananas, peaches and oranges.

Ken buys

4 apples weighing 125 g each

2 bananas weighing 170 g each

3 peaches weighing 135 g each

Each orange has a weight of 90 g.

The fruit has a total weight of 1.785 kg.

(a) Work out how many oranges Ken buys.

.....  
(3)

Jane wants to buy 15 tomatoes.

She asks for 1 kg of tomatoes at a shop.

Jane assumes that each tomato has a weight of 75 g.

(b) (i) If Jane's assumption is correct, will she get 15 tomatoes?

You must show how you get your answer.

(2)

(ii) If Jane's assumption is **not** correct, could she get 15 tomatoes?

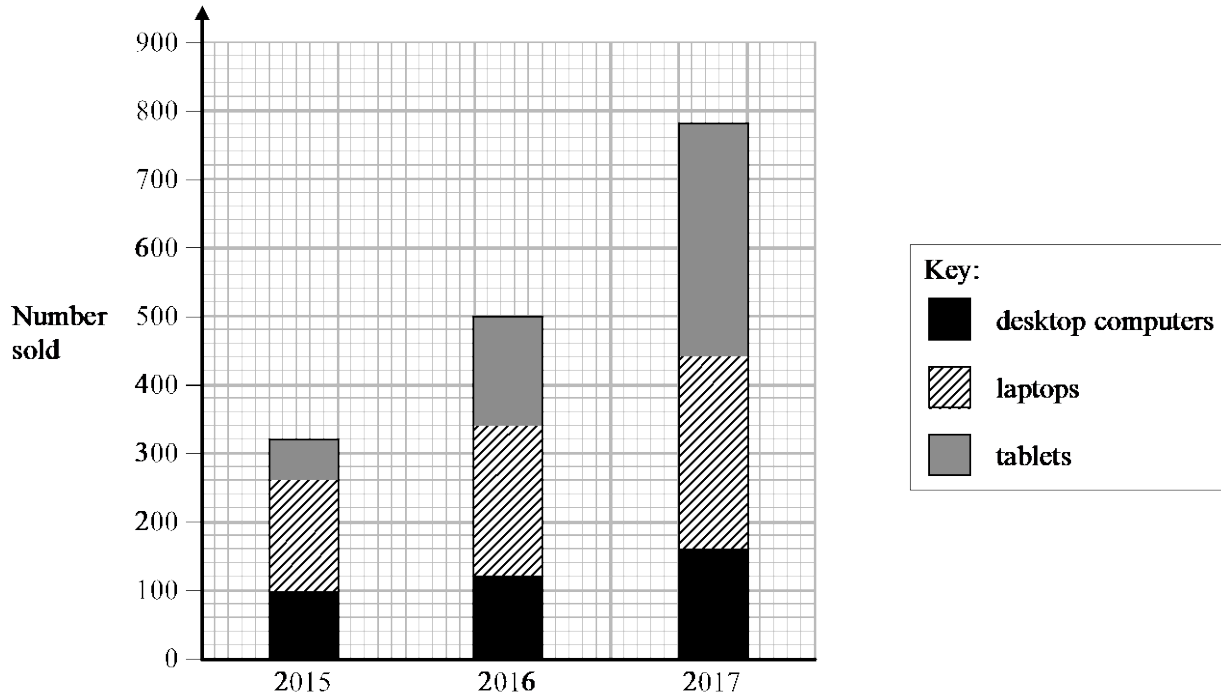
Justify your answer.

.....  
.....  
(1)

(Total for Question 4 is 6 marks)

**12** A shop sells desktop computers, laptops and tablets.

The composite bar chart shows information about sales over the last three years.



(a) Write down the number of desktop computers sold in 2015

.....  
(1)

(b) Work out the total number of laptops sold in the 3 years.

.....  
(3)

(c) State the item that had the greatest increase in sales over the 3 years.  
Give a reason for your answer.

.....  
.....  
(2)

Alex says,

“In 2017, more tablets were sold than desktop computers. This means the shop makes more profit from the sale of tablets than from the sale of desktop computers.”

(d) Is Alex correct?

You must justify your answer.

.....

.....

.....

**(1)**

**(Total for Question 12 is 7 marks)**

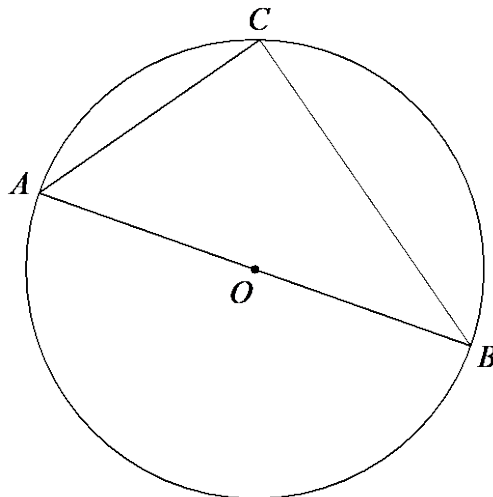
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Command words		What you need to know	Examples
16	Prove	More formal than 'show', all steps must be present. In the case of a geometrical proof, reasons must be given.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Prove - Example 1**  
**Nov 2017 - Paper 3H**

[Return to command word table](#)

20



$A$ ,  $B$  and  $C$  are points on the circumference of a circle, centre  $O$ .  
 $AOB$  is a diameter of the circle.

Prove that angle  $ACB$  is  $90^\circ$

You must **not** use any circle theorems in your proof.

(Total for Question 20 is 4 marks)

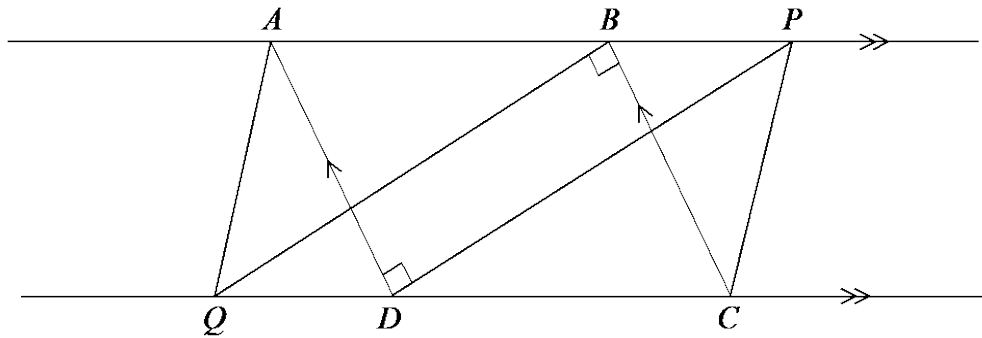
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**Prove - Example 2**  
**June 2018- Paper 3H**

[Return to command word table](#)

21



*ABCD* is a parallelogram.  
*ABP* and *QDC* are straight lines.  
Angle *ADP* = angle *CBQ* =  $90^\circ$

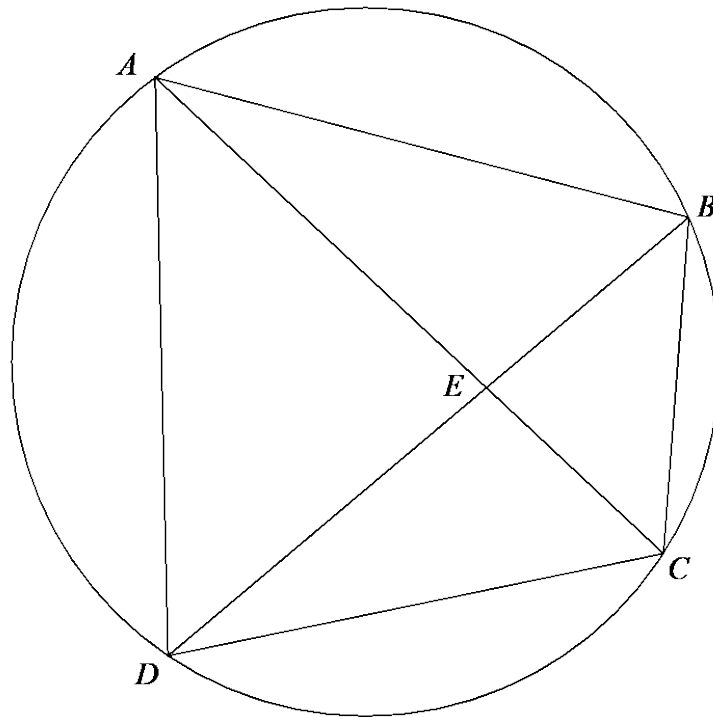
(a) Prove that triangle *ADP* is congruent to triangle *CBQ*.

(3)

**Prove - Example 3**  
**June 2017 - Paper 2H**

[Return to command word table](#)

- 15  $A, B, C$  and  $D$  are four points on the circumference of a circle.



$AEC$  and  $BED$  are straight lines.

Prove that triangle  $ABE$  and triangle  $DCE$  are similar.  
You must give reasons for each stage of your working.

---

**(Total for Question 15 is 3 marks)**

Command words		What you need to know	Examples
17	<b>Prove algebraically</b>	Use algebra in the proof.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Prove algebraically - Example 1**  
**June 2017- Paper 1H**

[Return to command word table](#)

- 16  $n$  is an integer greater than 1  
 Prove algebraically that  $n^2 - 2 - (n - 2)^2$  is always an even number.

(Total for Question 16 is 4 marks)

**Prove algebraically - Example 2**  
**Nov 2018- Paper 3H**

[Return to command word table](#)

- 15 Prove algebraically that the difference between the squares of any two consecutive odd numbers is always a multiple of 8

(Total for Question 15 is 3 marks)

**Prove algebraically - Example 3**  
**Nov 2017- Paper 1H**

[Return to command word table](#)

- 15  $x = 0.4\dot{3}\dot{6}$   
 Prove algebraically that  $x$  can be written as  $\frac{24}{55}$

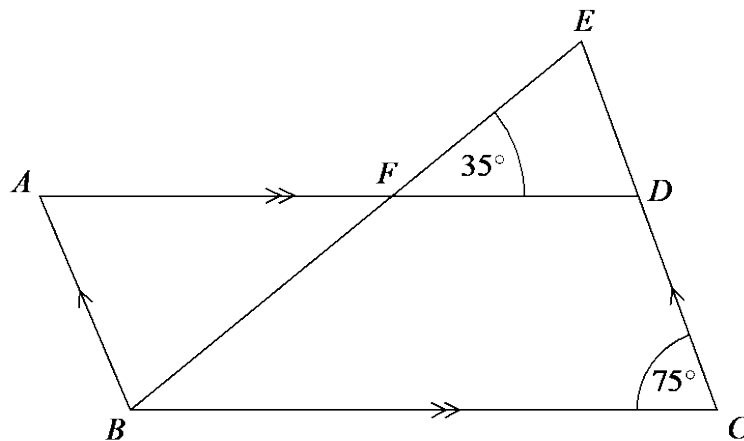
(Total for Question 15 is 3 marks)

Command words		What you need to know	Examples
18	Show	All working needed to get to a given answer <b>or</b> complete a diagram to show given information.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Show - Example 1**  
**Nov 2017- Paper 1H**

[Return to command word table](#)

3



$ABCD$  is a parallelogram.

$EDC$  is a straight line.

$F$  is the point on  $AD$  so that  $BFE$  is a straight line.

Angle  $efd = 35^\circ$

Angle  $DCB = 75^\circ$

Show that angle  $ABF = 70^\circ$

Give a reason for each stage of your working.

(Total for Question 3 is 4 marks)

**14** Here are the marks 20 students got in a French test.

76	82	84	69	80	64	70	81	75	91
87	67	80	70	94	76	81	69	71	77

(a) Show this information in a stem and leaf diagram.



---

(3)

**Show - Example 3**  
**June 2018 - Paper 3H**

[Return to command word table](#)

18 (a) Show that the equation  $x^3 + x = 7$  has a solution between 1 and 2.

(2)

(b) Show that the equation  $x^3 + x = 7$  can be rearranged to give  $x = \sqrt[3]{7-x}$

(1)

---

Command words		What you need to know	Examples
19	Simplify...	Simplify the given expression.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

### Simplify - Example 1

Nov 2017- Paper 3F

[Return to command word table](#)

- 2 Simplify  $y + 3y - 2y$

.....

(Total for Question 2 is 1 mark)

### Simplify - Example 2

June 2018- Paper 2H

[Return to command word table](#)

- 1 (a) Simplify  $m^3 \times m^4$

.....

(1)

- (b) Simplify  $(5np^3)^3$

.....

(2)

- (c) Simplify  $\frac{32q^9r^4}{4q^3r}$

.....

(2)

(Total for Question 1 is 5 marks)

### Simplify - Example 3

Nov 2018 - Paper 2F

[Return to command word table](#)

- 7 (a) Simplify  $3m - m - m + 3m$

.....

(1)

- (b) Simplify  $2 \times n \times p \times 4$

.....

(1)

(Total for Question 7 is 2 marks)

Command words		What you need to know	Examples
20	Simplify fully...	Simplify the given expression. Answer must be given in its simplest form.	<a href="#">Example 1</a> <a href="#">Example 2</a>

### Simplify fully - Example 1

Nov 2018 - Paper 1H

[Return to command word table](#)

17 Simplify fully  $\frac{3x^2 - 8x - 3}{2x^2 - 6x}$

.....  
(Total for Question 17 is 3 marks)

### Simplify fully - Example 2

June 2018 - Paper 1H

[Return to command word table](#)

15 (a) Factorise  $a^2 - b^2$

.....  
(1)

(b) Hence, or otherwise, simplify fully  $(x^2 + 4)^2 - (x^2 - 2)^2$

.....  
(3)  
(Total for Question 15 is 4 marks)



Command words		What you need to know	Examples
21	Solve	Find the solution of an equation or inequality.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Solve - Example 1**  
**June 2018 - Paper 3H**

[Return to command word table](#)

7 Solve  $\frac{5-x}{2} = 2x - 7$

$x = \dots\dots\dots$

(Total for Question 7 is 3 marks)

**Solve - Example 2**  
**Nov 2018 - Paper 3H**

[Return to command word table](#)

11 (a) Solve  $x + x + x = 51$

$x = \dots\dots\dots$   
**(1)**

(b) Solve  $\frac{y}{4} = 3$

$y = \dots\dots\dots$   
**(1)**

(c) Solve  $2f + 7 = 18$

$f = \dots\dots\dots$   
**(1)**

(Total for Question 11 is 3 marks)

**Solve - Example 3**  
**Nov 2018 - Paper 3H**

[Return to command word table](#)

- 9 (c) Solve  $5x^2 - 4x - 3 = 0$   
Give your solutions correct to 3 significant figures.

.....  
**(3)**

---

Command words		What you need to know	Examples
22	Solve algebraically	Find the solution of an equation or inequality; algebraic manipulation <b>must</b> be shown.	<a href="#">Example 1</a> <a href="#">Example 2</a>

### Solve algebraically - Example 1

[Return to command word table](#)

**Nov 2018 - Paper 3H**

- 19 Solve algebraically the simultaneous equations

$$\begin{aligned} 2x^2 - y^2 &= 17 \\ x + 2y &= 1 \end{aligned}$$

.....  
(Total for Question 19 is 5 marks)

### Solve algebraically - Example 2

[Return to command word table](#)

**June 2017 - 1H**

- 20 Solve algebraically the simultaneous equations

$$\begin{aligned} x^2 + y^2 &= 25 \\ y - 3x &= 13 \end{aligned}$$

.....  
(Total for Question 20 is 5 marks)

Command words		What you need to know	Examples
23	Write	No working is needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Write - Example 1**  
**June 2018 - Paper 1F**

[Return to command word table](#)

- 2 (a) Write the following numbers in order of size.  
Start with the smallest number.

-6                  6                  -5                  0                  12

.....  
(1)

- (b) Write the following numbers in order of size.  
Start with the smallest number.

0.078                  0.78                  0.87                  0.708

.....  
(1)

(Total for Question 2 is 2 marks)

**Write - Example 2**  
**Nov 2018 - Paper 2F**

[Return to command word table](#)

- 6 Here are four fractions.

$\frac{3}{4}$                    $\frac{5}{7}$                    $\frac{19}{25}$                    $\frac{11}{15}$

Write the fractions in order of size.  
Start with the smallest fraction.

.....  
(Total for Question 6 is 2 marks)

## Write - Example 3

[Return to command word table](#)

Nov 2017 - Paper 1H

1 Write 36 as a product of its prime factors.

.....

(Total for Question 1 is 2 marks)

Command words		What you need to know	Examples
24	Write down	No working needed for 1 mark questions. Working may be needed questions with more than 1 mark.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

## Write down- Example 1

[Return to command word table](#)

June 2018 - Paper 2F

4 Write down a 6 digit number that has 4 as its thousands digit.  
You can only use the digit 4 once.

.....

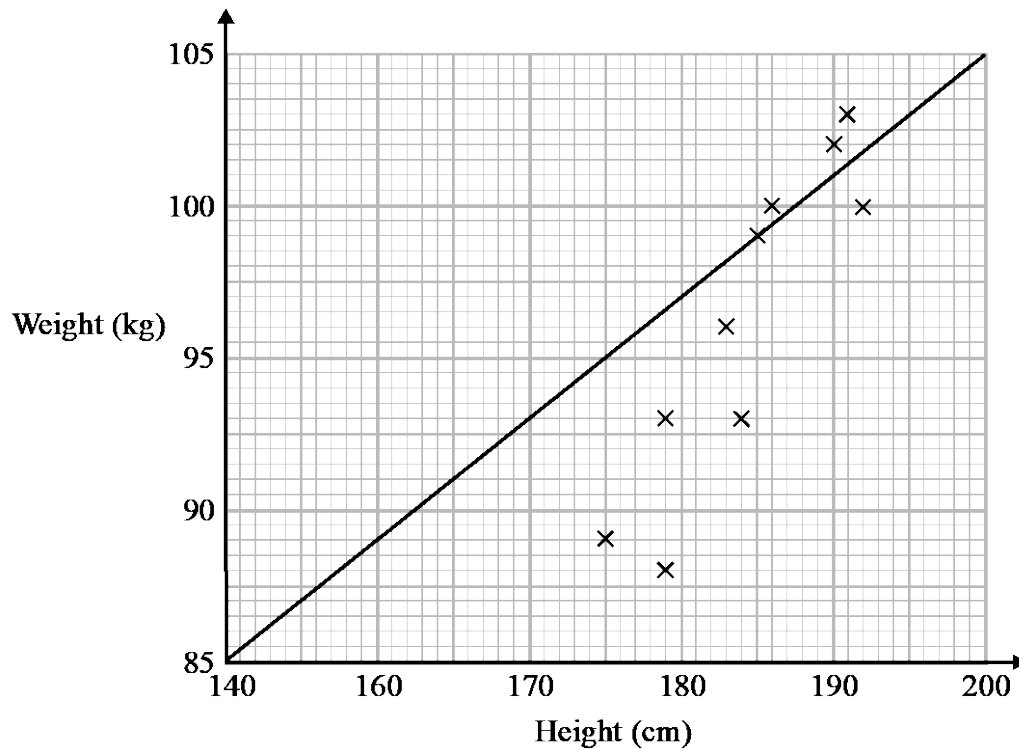
(Total for Question 4 is 1 mark)

## Write down- Example 2

[Return to command word table](#)

Nov 2018 - Paper 2H

- 2 Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players. He is asked to draw a scatter graph and a line of best fit for this information. Here is his answer.



Sean has plotted the points accurately.

Write down two things that are wrong with his answer.

1.....

.....

2.....

.....

(Total for Question 2 is 2 marks)

### Write down- Example 3

[Return to command word table](#)

**Nov 2017 - Paper 2H**

**18** At time  $t = 0$  hours a tank is full of water.

Water leaks from the tank.

At the end of every hour there is 2% less water in the tank than at the start of the hour.

The volume of water, in litres, in the tank at time  $t$  hours is  $V_t$

Given that

$$V_0 = 2000$$

$$V_{t+1} = kV_t$$

write down the value of  $k$ .

$k = \dots\dots\dots$

**(Total for Question 18 is 1 mark)**

---

Command words		What you need to know	Examples
25	Work out	Some working will be needed in order to get the answer.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

**Work out - Example 1**  
**Nov 2017 - Paper 2H**

[Return to command word table](#)

- 2 Emily buys a pack of 12 bottles of water.  
The pack costs £5.64.  
Emily sells all 12 bottles for 50p each.  
Work out Emily's percentage profit.  
Give your answer correct to 1 decimal place.

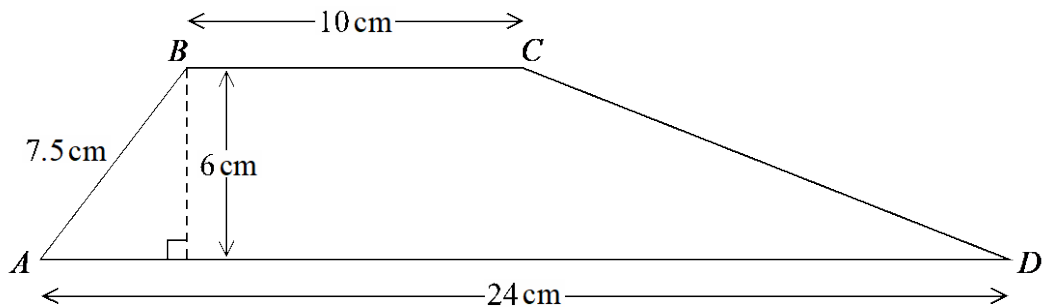
.....%

(Total for Question 2 is 3 marks)

**Work out - Example 2**  
**Nov 2017 - Paper 2H**

[Return to command word table](#)

- 7  $ABCD$  is a trapezium.



- Work out the size of angle  $CDA$ .  
Give your answer correct to 1 decimal place.

..... °

(Total for Question 7 is 5 marks)



### Work out - Example 3

Nov 2018 - Paper 2F

[Return to command word table](#)

- 25  $A$  is the point with coordinates  $(5, 9)$   
 $B$  is the point with coordinates  $(d, 15)$

The gradient of the line  $AB$  is 3

Work out the value of  $d$ .

.....  
(Total for Question 25 is 3 marks)

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