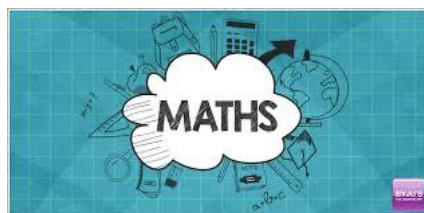


# Year 7 Maths



## Home Learning Summer Term



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**Remember, you do not need to complete these questions in the given order. If you find a topic/question difficult, move on to another topic/question and then go back to the difficult topic/question at the end.**

**There are some useful websites listed on the last page of this booklet which might be helpful if you are stuck.**

**You can also contact your teacher via email, the hegarty maths website or Microsoft Teams if you are stuck and need help.**

## Types of Numbers

### Things to remember:

- A factor is a whole number that divides exactly into another number.
- A multiple is a number that may be divided by another a certain number of times without a remainder.
- A prime number only has 2 factors; 1 and itself.
- A power tells us how many times the base number has been multiplied by itself
- A root is the opposite of a power.
- A square number is the result of multiplying an integer (whole number) by itself.

### Questions:

1. (a) Write down the square of 8

.....  
(1)

(b) Write down the value of  $10^3$

.....  
(1)

(c) Estimate the value of  $\sqrt{20}$

.....  
(1)

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

2. Here is a list of eight numbers: 4 5 14 25 29 30 33 39 40  
From the list, write down

(i) a factor of 20

.....

(ii) a multiple of 10

.....

(iii) the prime number that is greater than 15

.....

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

3. Express 180 as a product of its prime factors(Hint: Draw a prime factor tree).

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

4. (a) Write down the value of  $7^2$   
 .....  
 (1)
- (b) Write down the value of  $\sqrt{25}$   
 .....  
 (1)
- (c) Write down the value of  $2^3$   
 .....  
 (1)
- (Total for Question is 3 marks)**

5. (a) Write down the value of  $\sqrt{81}$   
 .....  
 (1)
- (b) Work out the value of  $5^2 + 2^3$   
 .....  
 (2)
- (Total for Question is 3 marks)**

6. Here is a list of numbers:  
 2    3    10    12    15    16    24  
 From the list write down
- (i) an odd number  
 .....  
 (1)
- (b) a multiple of 6  
 .....  
 (1)
- (c) a factor of 18  
 .....  
 (1)
- (Total for Question is 3 marks)**

7. Here is a list of numbers.  
 2    3    5    8    10    16    21    24  
 From the numbers in the list,
- (a) write down an odd number  
 .....  
 (1)
- (b) write down the square number  
 .....  
 (1)
- (c) write down the number which is a multiple of 6  
 .....  
 (1)
- (Total for Question is 3 marks)**

8. Here is a list of numbers.  
 1    2    4    5    7    11    13    14    15    17  
 From the list, write down three different prime numbers that add together to make 20

# Place Value

## Things to remember:

Label columns as below

Thousands	Hundreds	Tens	Units ●	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
-----------	----------	------	---------	----------------	-----------------	------------------

## Questions:

1. (a) Write the number **seven thousand and twenty five** in figures.

..... (1)

(b) Write the number 9450 in words.

..... (1)

(c) Write the number 28.75 to the nearest whole number.

..... (1)

(d) Write the number 7380 to the nearest thousand.

..... (1)

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

2. Write down the value of the 3 in the number 4376

..... (1)

**(Total for question = 1 mark)**

3. Write down the value of the 3 in 16.35

..... (1)

**(Total for question is 1 mark)**

4. (a) Work out  $90 \div 10$

..... (1)

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

2.8                  4.71                  0.6                  13.4

..... (1)

(c) Write  $\frac{7}{10}$  as a decimal.

..... (1)

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

5. (a) Write these numbers in order of size. Start with the smallest number.  
 3517          7135          5713          1357
- ..... (1)
- (b) Write these numbers in order of size. Start with the smallest number.  
 0.354          0.4          0.35          0.345
- ..... (1)
- (Total for Question is 2 marks)**

6. Here are four cards. There is a number on each card.
- 4

5

2

1
- (a) Write down the largest 4-digit even number that can be made using each card only once.
- ..... (2)
- (b) Write down all the 2-digit numbers that can be made using these cards.
- ..... (2)
- (Total for question is 4 marks)**

7. (a) Write these numbers in order of size. Start with the smallest number.  
 3007          4435          399          4011          3333
- ..... (1)
- (b) Write these numbers in order of size. Start with the smallest number.  
 3.7          5.62          0.7          14.3
- ..... (1)
- (c) Write  $\frac{9}{10}$  as a decimal. .... (1)
- (Total for question = 3 marks)**

8. Write the following numbers in order of size. Start with the smallest number.  
 0.61          0.1          0.16          0.106
- .....

## Directed Numbers

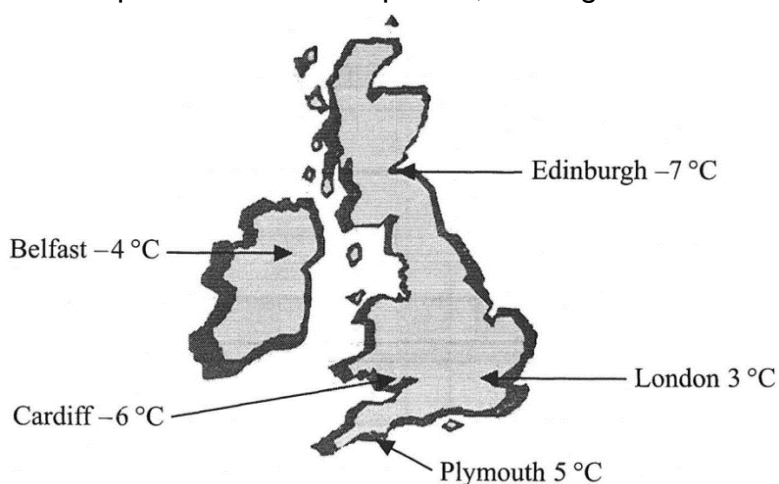
### Things to remember:

- Mixed means minus!
- Use a number line – if you're adding you need to move in a positive direction (right), if you're subtracting you need to move in a negative direction (left).



### Questions:

1. Here is a map of the British Isles.  
The temperatures in some places, one night last winter are shown on the map.



- (a) (i) Write down the names of the two places that had the biggest difference in temperature.
- .....  
.....
- (ii) Work out the difference in temperature between these two places.
- ..... $^{\circ}\text{C}$   
(3)
- (b) Two pairs of places have a difference in temperature of  $2^{\circ}\text{C}$ .  
Write down the names of these places.
- (i) ..... and .....
- (ii) ..... and .....

(2)  
**(Total 5 marks)**

2. Sally wrote down the temperature at different times on 1<sup>st</sup> January 2003.

Time	Temperature
midnight	- 6 °C
4 am	-10 °C
8 am	- 4 °C
noon	7 °C
3 pm	6 °C
7 pm	-2 °C

- (a) Write down
- (i) the **highest** temperature, ..... °C
  - (ii) the **lowest** temperature. .... °C
- (2)**

- (b) Work out the difference in the temperature between
- (i) 4 am and 8 am, ..... °C
  - (ii) 3 pm and 7 pm. .... °C
- (2)**

At 11 pm that day the temperature had fallen by 5 °C from its value at 7 pm.

- (c) Work out the temperature at 11 pm.
- ..... °C  
**(1)**
- (Total 5 marks)**

3. The table shows the temperature on the surface of each of five planets.

Planet	Temperature
Venus	480 °C
Mars	- 60 °C
Jupiter	- 150 °C
Saturn	- 180 °C
Uranus	- 210 °C

- (a) Work out the difference in temperature between Mars and Jupiter. .... °C
- (1)**
- (b) Work out the difference in temperature between Venus and Mars. .... °C
- (1)**
- (c) Which planet has a temperature 30 °C higher than the temperature on Saturn?
- .....  
**(1)**

The temperature on Pluto is 20 °C lower than the temperature on Uranus.

- (d) Work out the temperature on Pluto. .... °C
- (1)**
- (Total 4 marks)**



4. The table shows the highest and lowest temperatures one day in London and Moscow.

	Highest	Lowest
London	8°C	-6°C
Moscow	-3°C	-8°C

- (a) Work out the difference between the **lowest** temperature in London and the **lowest** temperature in Moscow.
- .....°C  
(1)
- (b) Work out the difference between the **highest** and **lowest** temperature in London.

.....°C  
(1)

**(Total 2 marks)**

5. The table shows the midday temperatures in 4 different cities on Monday.

City	Midday temperature (°C)
Belfast	5
Cardiff	-1
Glasgow	-6
London	-4

- (a) Which city had the lowest temperature?
- .....  
(1)
- (b) Work out the difference between the temperature in Cardiff and the temperature in Belfast.

.....°C  
(1)

By Tuesday, the midday temperature in London had risen by 7 °C.

- (c) Work out the midday temperature in London on Tuesday.
- .....°C  
(1)
- (Total 3 marks)**

6. Mr Snow stayed some time at the South Pole.

The highest temperature there was -30 °C.

The lowest temperature there was -57 °C.

- (a) Work out the difference between the highest temperature and the lowest temperature at the South Pole.

.....°C  
(1)

Mr Snow returned to his house in London.

The temperature outside his house was -2 °C.

The temperature inside his house was 12 °C higher.

- (b) Work out the temperature inside his house.
- .....°C  
(1)
- (Total 2 marks)**

7. Write these temperatures in order. Start with the lowest temperature.

7°C

-2°C

10°C

-5°C

3°C

.....  
**(Total for question = 1 mark)**

## Collecting Like Terms (Simplifying)

### Things to remember:

- $2a$  means  $a + a$  or 2 lots of  $a$
- $a^2$  means  $a \times a$
- The sign (+ or -) belongs to the term following it. You may find it easier to identify like terms using two different highlighters.

### Questions:

1. (a) Simplify  $a + a + a + a$

.....  
(1)

(b) Simplify  $3 \times c \times d$

.....  
(1)

(c) Simplify  $3ef + 5ef - ef$

.....  
(1)

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

2. (a) Simplify  $b + b + b + b$

.....  
(1)

(b) Simplify  $8n - 3n$

.....  
(1)

(c) Simplify  $3 \times c \times d$

.....  
(1)

(d) Simplify  $3x + 7y + 2x - y$

.....  
(2)

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

3. Simplify  $3x + 5y + x + 4y$

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

4. (a) Simplify  $a \times c \times 3$

.....  
(1)

(b) Simplify  $p \times p \times p$

.....  
(1)

(c) Simplify  $5x - 4y + 3x - 3y$

.....  
(2)  
**(Total for Question is 4 marks)**

5. (a) Simplify  $5a - 2a$

.....  
(1)

(b) Simplify  $3 \times 4y$

.....  
(1)

(c) Simplify  $3e + 4f + 2e - f$

.....  
(2)  
**(Total for Question is 4 marks)**

6. (a) Simplify  $m + m + m$

.....  
(1)

(b) Simplify  $9e - 2e$

.....  
(1)

(c) Simplify  $5 \times 3g$

.....  
(1)

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

7. (a) Simplify  $d + d + d + d$

.....  
(1)

(b) Simplify  $3 \times e \times f$

.....  
(1)

(c) Simplify  $2x + 3y + 3x - y$

.....  
(2)

**(Total for question = 4 marks)**

8. (a) Simplify  $f + f + f + f - f$

.....  
(1)

(b) Simplify  $2m \times 3$

.....  
(1)

(c) Simplify  $3a + 2h + a + 3h$

.....  
(2)

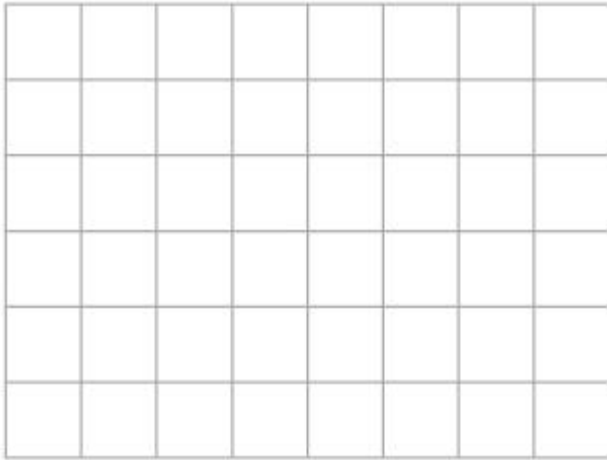
**(Total for Question is 4 marks)**

## Types of Shapes and their Properties

### Things to remember:

- Sides and vertices belong on 2D shapes.

1. (a) On the grid, draw a kite.



(b) Here is a quadrilateral.



Write down the special name of this quadrilateral.

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

2. Draw a sketch of a pentagon.

(Total for Question is 1 marks)

3. Here is a list of the names of five types of quadrilateral.

Trapezium                  Parallelogram                  Square                  Rhombus                  Rectangle

(a) From the list, write down the names of two quadrilaterals which must have all four sides the same length.

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

(b) From the list, write down the name of the quadrilateral that has only one pair of parallel sides.

..... (1)

For one of these quadrilaterals: the corners are not right angles,  
the quadrilateral has rotational symmetry of order 2  
and the diagonals cross at right angles.

(c) Write down the name of this quadrilateral.

..... (1)

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

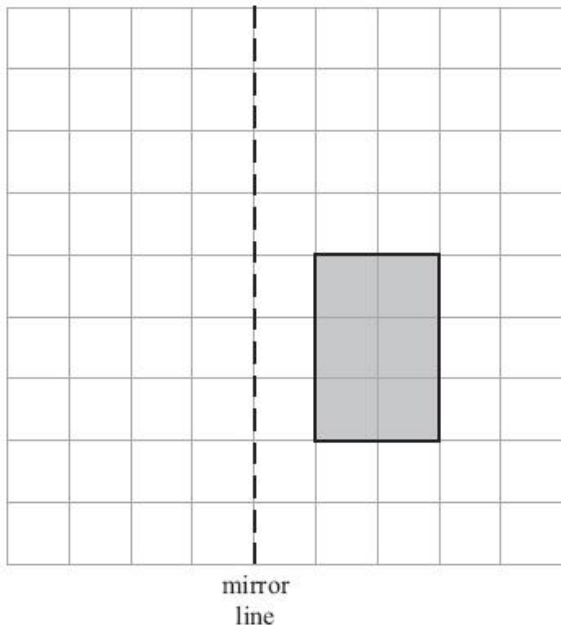
## Reflection, Rotation and Symmetry

### Things to remember:

- A reflection is where the shape is flipped.
- A rotation is where the shape is turned.

### Questions:

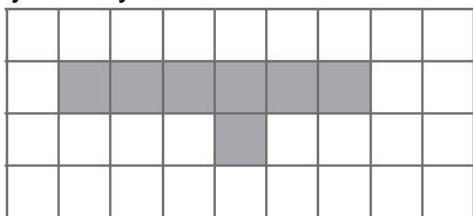
1. Here is a shaded shape on a grid of centimetre squares.



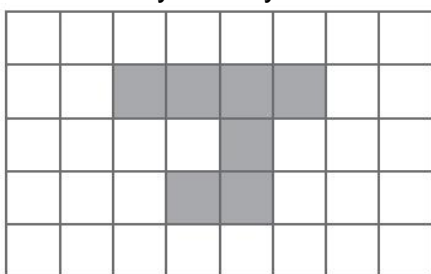
Reflect the shaded shape in the mirror line.

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

2. (a) On the grid, shade in one more square so that the completed shape has one line of symmetry.



- (b) On the grid below, shade in two more squares so that the completed shape has rotational symmetry of order 2



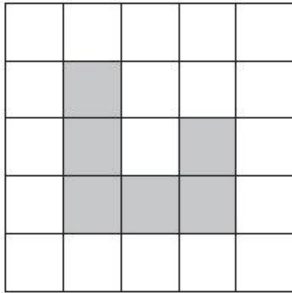
**(1)**

**(1)**

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

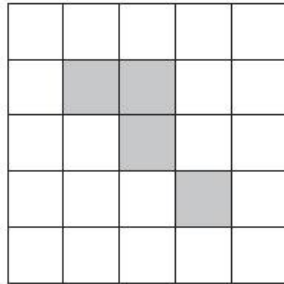


3. (a) Shade **one** more square to make a pattern with 1 line of symmetry.



(1)

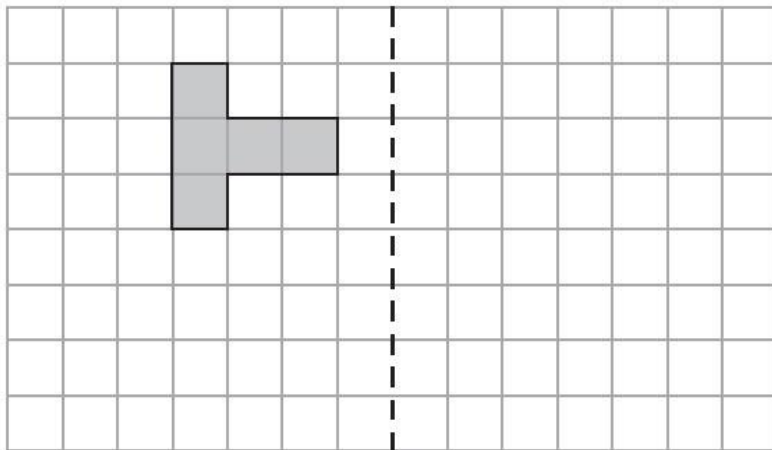
(b) Shade **one** more square to make a pattern with rotational symmetry of order 2



(1)

(Total for Question is 2 marks)

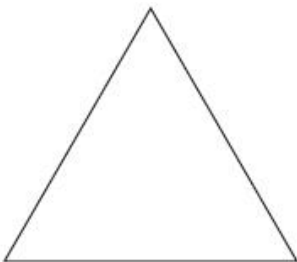
4. Reflect the shaded shape in the mirror line.



mirror line

(Total for Question is 2 marks)

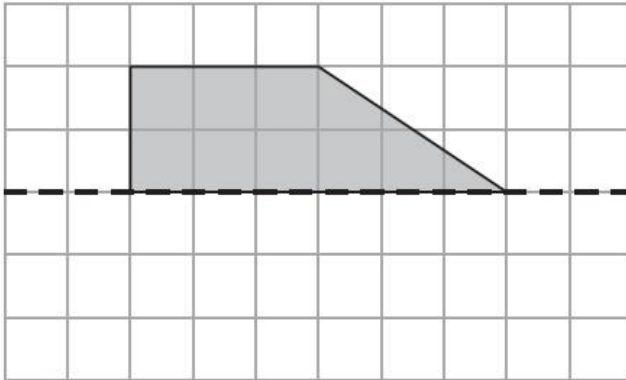
5. Here is an equilateral triangle.



Write down the order of rotational symmetry of the triangle.

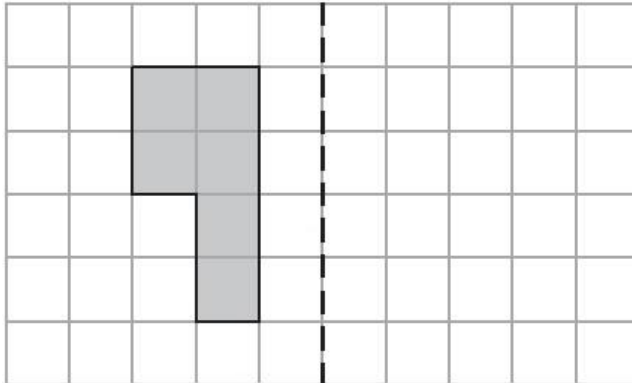
.....  
(Total for Question is 1 mark)

6. (a) Reflect the shaded shape in the mirror line.



(1)

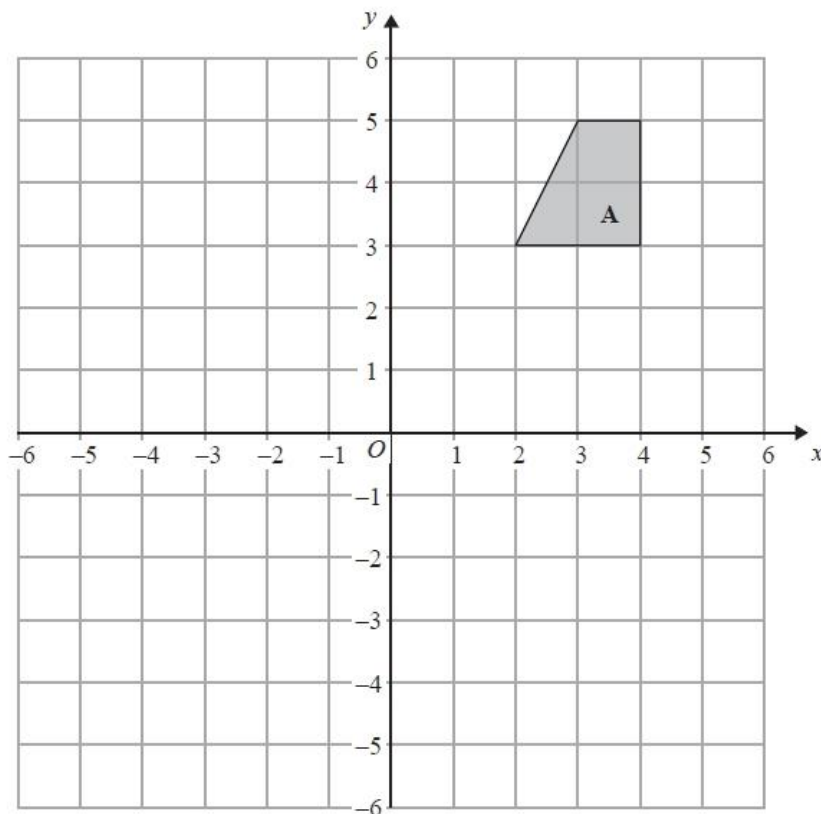
- (b) Reflect the shaded shape in the mirror line.



(1)

(Total for Question is 2 marks)

7. On the grid, rotate shape **A**  $180^\circ$  about the point  $(1, 1)$ .



(Total for Question is 2 marks)

8. (a) (i) Shade 4 sectors on diagram **A** so that it has rotational symmetry of order 4

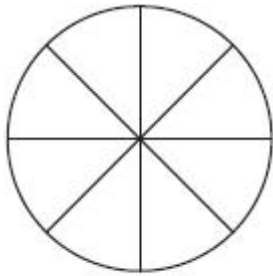


diagram **A**

- (ii) Shade 4 sectors on diagram **B** so that it has rotational symmetry of order 2

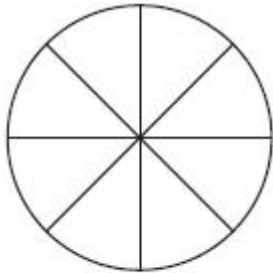


diagram **B**

**(Total for question = 2 marks)**

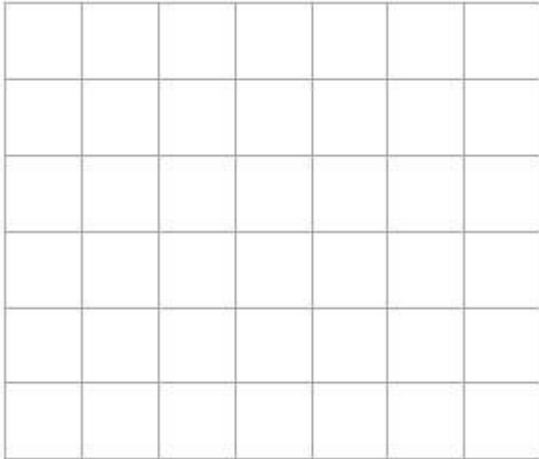
## Area and Perimeter of Rectangles and Triangles

### Things to remember:

- Area of a rectangle = base x height
- Area of a triangle =  $\frac{1}{2}$  x base x height
- The perimeter is the distance around the outside of shape

### Questions:

1. On the centimetre grid, draw a rectangle with an area of  $12 \text{ cm}^2$ .



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

2. On the grid of centimetre squares, draw a rectangle with a perimeter of 10 cm.



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

3. Here is a rectangle. Work out the area of this rectangle.

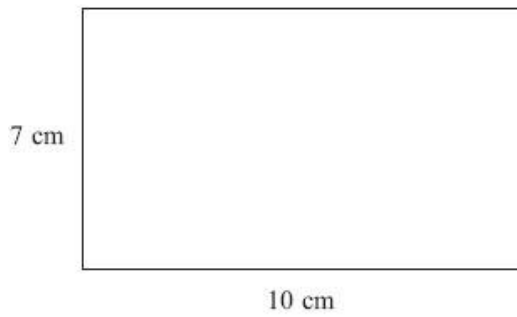
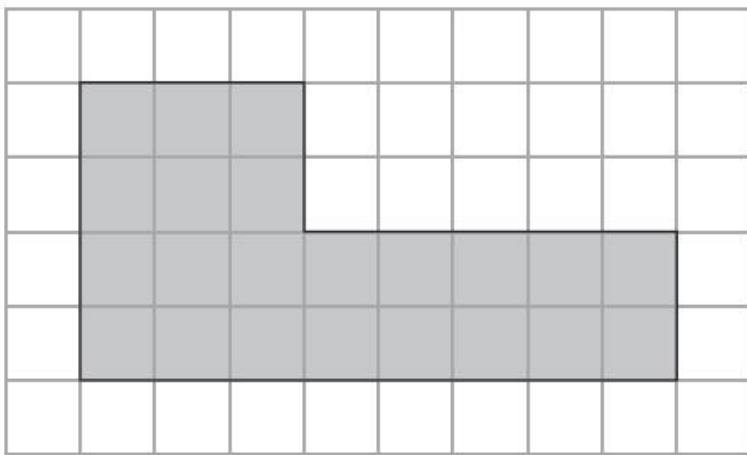


Diagram **NOT** accurately drawn

..... cm<sup>2</sup>  
**(Total for Question is 2 marks)**

4. The shaded shape is drawn on a grid of centimetre squares.



(a) Find the perimeter of the shaded shape.

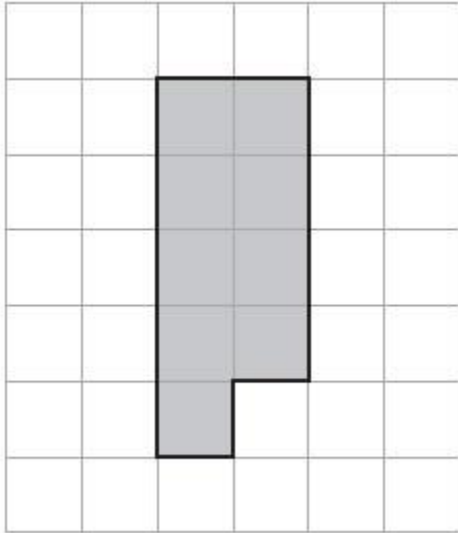
..... cm  
**(1)**

(b) Find the area of the shaded shape.

..... cm<sup>2</sup>  
**(1)**

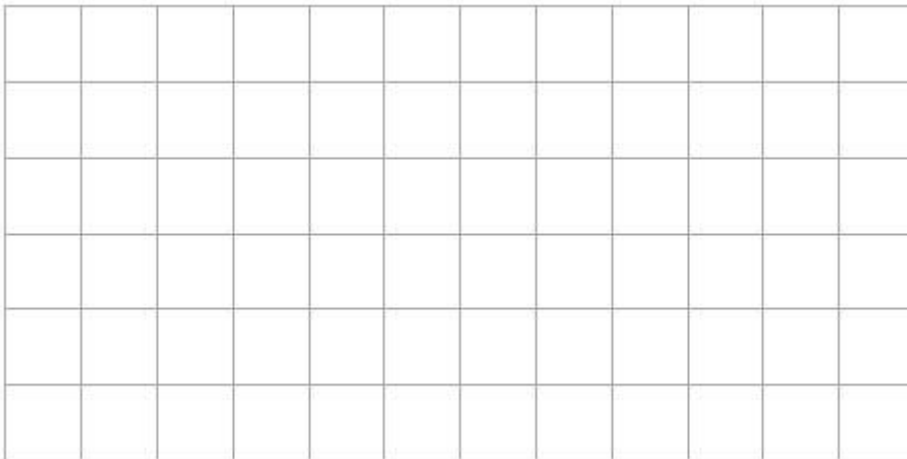
**(Total for Question is 2 marks)**

5. The shaded shape is drawn on a grid of centimetre squares.  
 (a) Find the perimeter of the shaded shape.



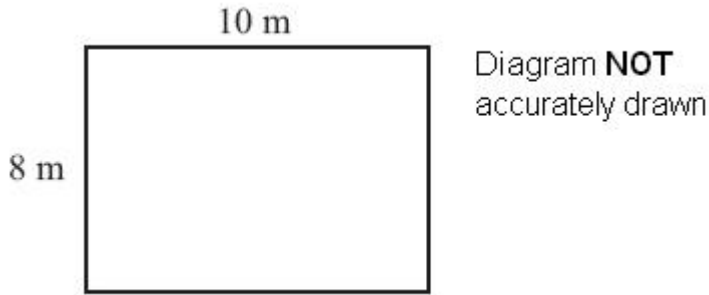
..... cm  
 (2)

- (b) On the grid below, draw a square with the same area as the shaded shape.



(1)  
 (Total for Question is 3 marks)

6. Dilys buys a new house.  
She wants to have a lawn in the back garden.  
The lawn is going to be in the shape of a rectangle.



The lawn will have a length of 10 m. The lawn will have a width of 8 m.  
Dilys wants to buy edging strip for her lawn.  
The length of the edging strip needs to be equal to the perimeter of her lawn.  
Edging strip costs £1.50 per metre. What is the total cost of the edging strip?

£.....  
**(Total for Question is 4 marks)**

7. The diagram shows a garden with 4 flower beds.  
The garden is a rectangle, 23 m by 17 m.

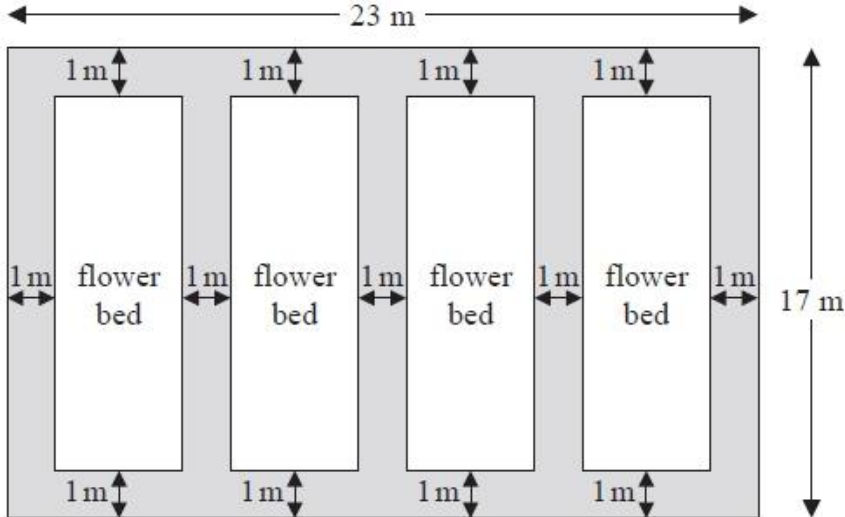


Diagram NOT accurately drawn  
Each flower bed is a rectangle with the same length and the same width.  
Work out the length and the width of a flower bed.

length =.....m

width =.....m

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

8. The diagram shows a rectangle and a square.

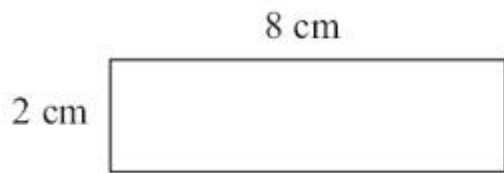


Diagram **NOT** accurately drawn

The perimeter of the rectangle is the same as the perimeter of the square.  
Work out the length of one side of the square.

..... cm  
**(Total for Question is 4 marks)**



# Measures

## Things to remember:

- There are 60 seconds in a minute and 60 minutes in an hour.
- Be careful when reading scales – continue to count on until you reach the next written value to check.

## Questions:

1. Here is a clock in a school.



- (a) (i) School starts 15 minutes earlier than the time shown on the clock.  
What time does school start?  
..... (1)
- (ii) The first lesson ends 45 minutes after the time shown on the clock.  
What time does the first lesson end?  
..... (2)

- (b) School finishes at 3.20 pm. Write 3.20 pm using the 24-hour clock.  
..... (1)

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

2. (a) How many minutes are there between 8.50 pm and 10.05 pm?  
..... minutes (1)

- (b) (i) Write 15 25 using the 12-hour clock.  
.....
- (ii) Write 9.15 pm using the 24-hour clock.  
..... (2)

Lucy and Saad went to a cafe on the same day.  
Lucy was in the cafe from 10.15 am to 10.45 am.  
Saad was in the cafe from 10.25 am to 11.05 am.

- (c) Work out the number of minutes that Lucy and Saad were in the cafe at the same time.  
..... minutes (2)

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

3. Complete this table. Write a sensible unit for each measurement.

	Metric	Imperial
The length of a pencil	centimetres	.....
The weight of a tomato	.....	ounces
The amount of milk in a bottle	.....	pints

(Total for Question is 3 marks)

4. (a) Complete this table. Write a sensible unit for each measurement.

	Metric	Imperial
Diameter of a football	.....	inches
Amount of fuel in a car fuel tank	litres	.....

(2)

(b) (i) Change 4 kg to grams.

..... grams

(ii) Change 3500 ml to litres.

..... litres

(2)

(Total for Question is 4 marks)

5. (a) Write 3 metres in centimetres.

..... centimetres

(1)

(b) Write 4000 grams in kilograms.

..... kilograms

(1)

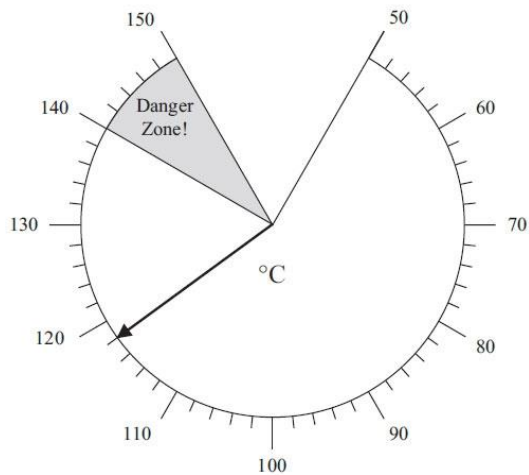
(c) Write 700 millilitres in litres.

..... litres

(1)

(Total for question = 3 marks)

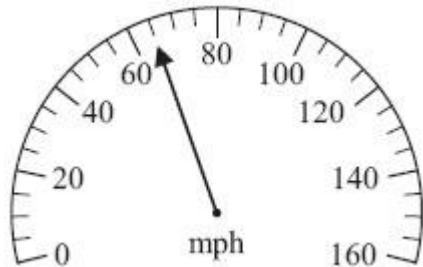
6. The diagram shows a temperature gauge.



How many degrees does the temperature have to rise to get to the danger zone?

..... °C  
**(Total for Question is 2 marks)**

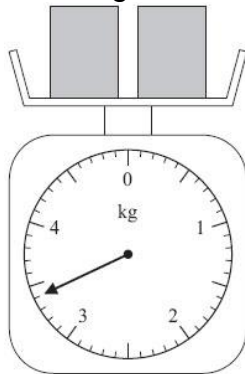
7. The diagram shows the speed of a car.



(a) Write down the speed.

..... mph  
**(1)**

The diagram shows two boxes on some scales.

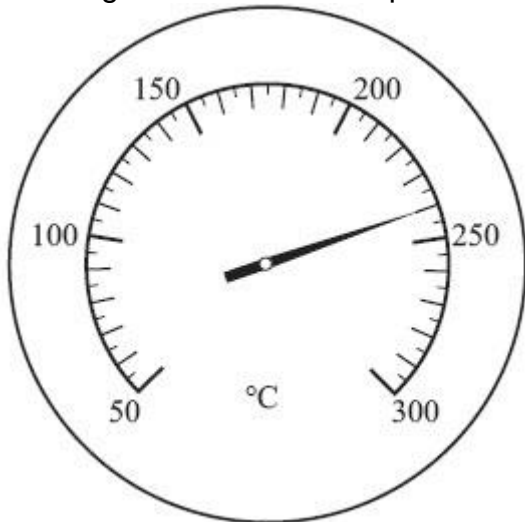


Each box has the same weight.

(b) Work out the weight of each box.

..... kg  
**(2)**  
**(Total for Question is 3 marks)**

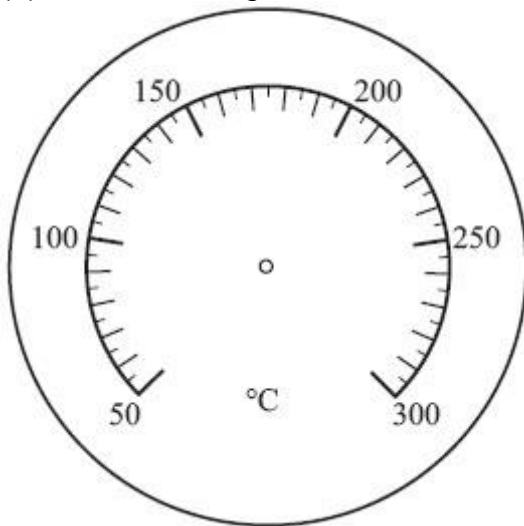
8. The diagram shows the temperature in an oven.



- (a) Write down the temperature.

..... °C  
(1)

- (b) On the diagram below, draw an arrow to show a temperature of 125°C.



(1)

Lorna switches her oven on at 5.50 pm.

She sets the temperature at 180°C.

It takes 15 minutes for the oven to reach a temperature of 180°C.

- (c) What time will the oven reach a temperature of 180°C?

.....  
(1)  
(Total for Question is 3 marks)

## Averages

### Things to remember:

- Mean is mean to work out – add all the numbers together and divide by the quantity in the list.

### Questions:

1. Chloe made a list of her homework marks.

4 5 5 5 4 3 2 1 4 5

- (a) Work out her mean homework mark.

.....  
(2)  
(Total 2 marks)

2. Peter rolled a 6-sided dice ten times.  
Here are his scores.

3 2 4 6 3 3 4 2 5 4

- (a) Work out the mean of his scores.

.....  
(2)  
(Total 2 marks)

3. Mr Smith kept a record of the number of absences for each student in his class for one term.

Here are his results.

0 0 0 8 4 5 5 3 2 1

- (a) Work out the mean.

.....  
(2)  
(Total 2 marks)

4. Here are ten numbers.

7 6 8 4 5 9 7 3 6 7

- (a) Work out the mean.

.....  
(2)  
(Total 4 marks)

5. Here are the test marks of 6 girls and 4 boys.

Girls: 5 3 10 2 7 3

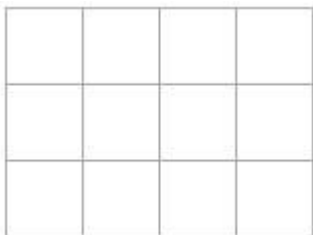
Boys: 2 5 9 3

- (d) Work out the mean mark of all 10 students.

(1)

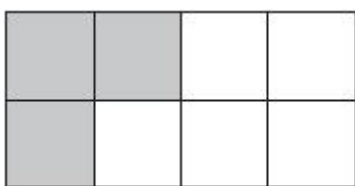
## Fractions

1. Here is a shape. Shade  $\frac{3}{4}$  of this shape.



(Total for Question is 1 mark)

2. (a) Write down the fraction of this shape that is shaded.



..... (1)

- (b) Shade  $\frac{1}{5}$  of this shape.



(1)

Here are some fractions.

$$\frac{3}{10}$$

$$\frac{2}{8}$$

$$\frac{4}{12}$$

$$\frac{12}{40}$$

$$\frac{5}{20}$$

- Two of these fractions are equivalent to  $\frac{1}{4}$   
(c) Which two fractions?

..... and .....

(2)

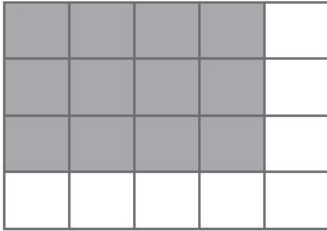
(Total for question = 5 marks)

3. Why does  $\frac{1}{4} = \frac{2}{8}$ ?

.....  
.....

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

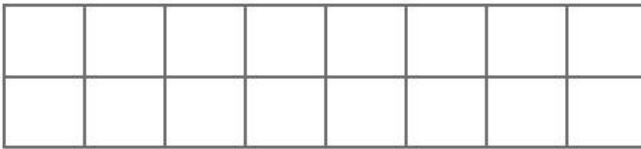
4. (a) What fraction of this shape is shaded?



Write your fraction in its simplest form.

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

(b) Shade  $\frac{3}{8}$  of this shape.



**(1)**  
**(Total for Question is 3 marks)**

5. Write 35 out of 65 as a fraction.  
Give your fraction in its simplest form.

.....  
**(Total for question = 2 marks)**

# **Useful websites:**

**[www.hegartymaths.com](http://www.hegartymaths.com)**

**[www.dr frostmaths.com](http://www.dr frostmaths.com)**

**[www.bbc.co.uk/bitesize](http://www.bbc.co.uk/bitesize)**

**[www.onmaths.com](http://www.onmaths.com)**

**[www.mathedup.co.uk](http://www.mathedup.co.uk)**

**[www.mathsgenie.co.uk](http://www.mathsgenie.co.uk)**

**Remember: Do your best!  
It is all you can do 😊**