

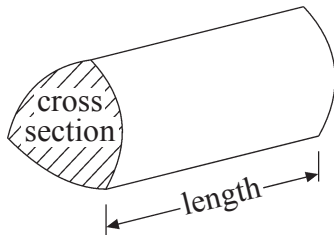
## GCSE Mathematics (Linear) 1380

Formulae: Higher Tier



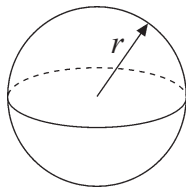
**You must not write on this formulae page.**  
**Anything you write on this formulae page will gain NO credit.**

**Volume of a prism** = area of cross section  $\times$  length



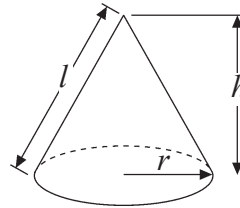
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**Surface area of sphere** =  $4\pi r^2$

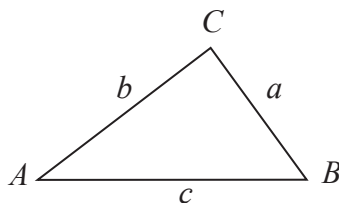


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$

where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2}ab \sin C$



**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

**You must NOT use a calculator.**

1. Using the information that

$$74 \times 234 = 17316$$

write down the value of

(a)  $740 \times 234$

.....  
(1)

(b)  $74 \times 2.34$

.....  
(1)

**(Total 2 marks)**

Q1

2. Work out an estimate for the value of

$$\frac{31 \times 4.92}{0.21}$$

.....  
**(Total 3 marks)**

Q2

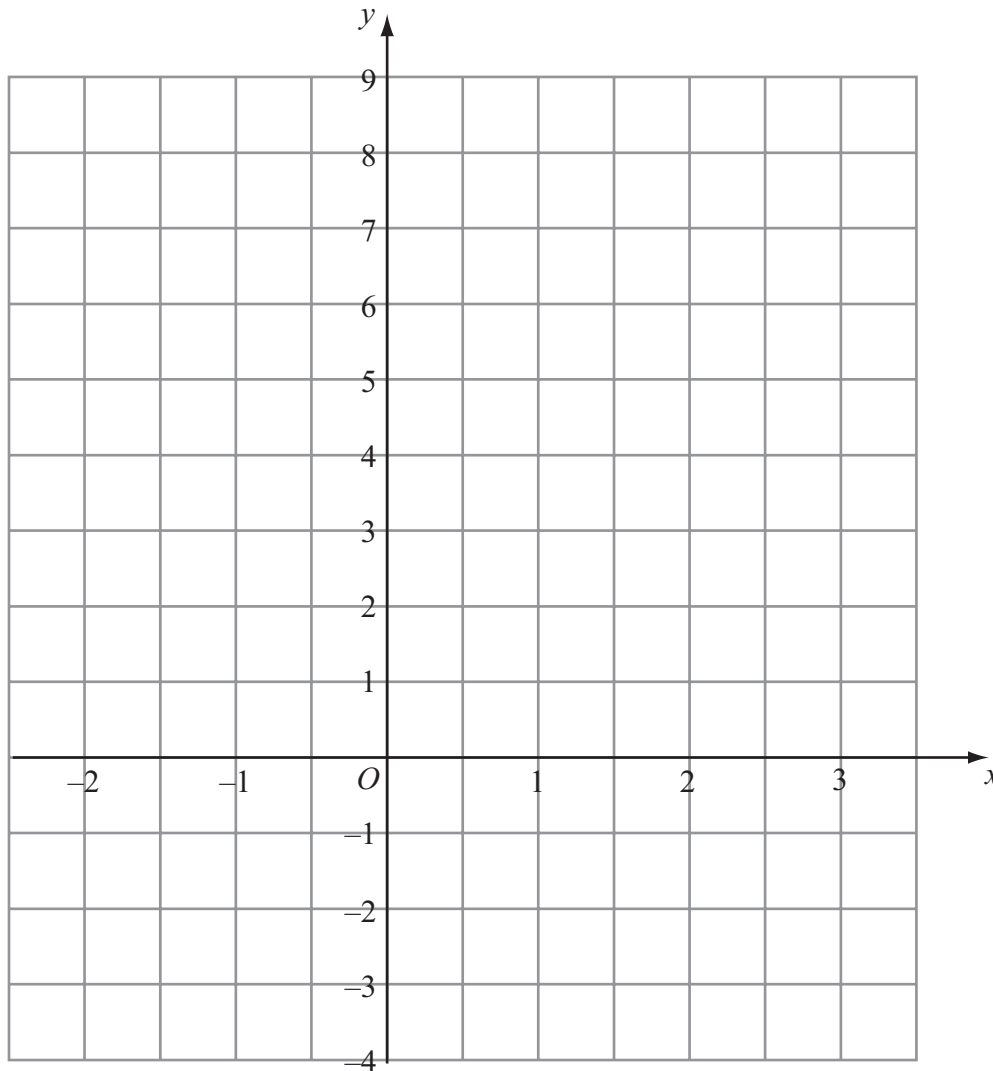


3. (a) Complete the table of values for  $y = 2x + 2$

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

(2)

(b) On the grid, draw the graph of  $y = 2x + 2$



(2)

(c) Use your graph to find

(i) the value of  $y$  when  $x = -1.5$

$y = \dots\dots\dots$

(ii) the value of  $x$  when  $y = 7$

$x = \dots\dots\dots$

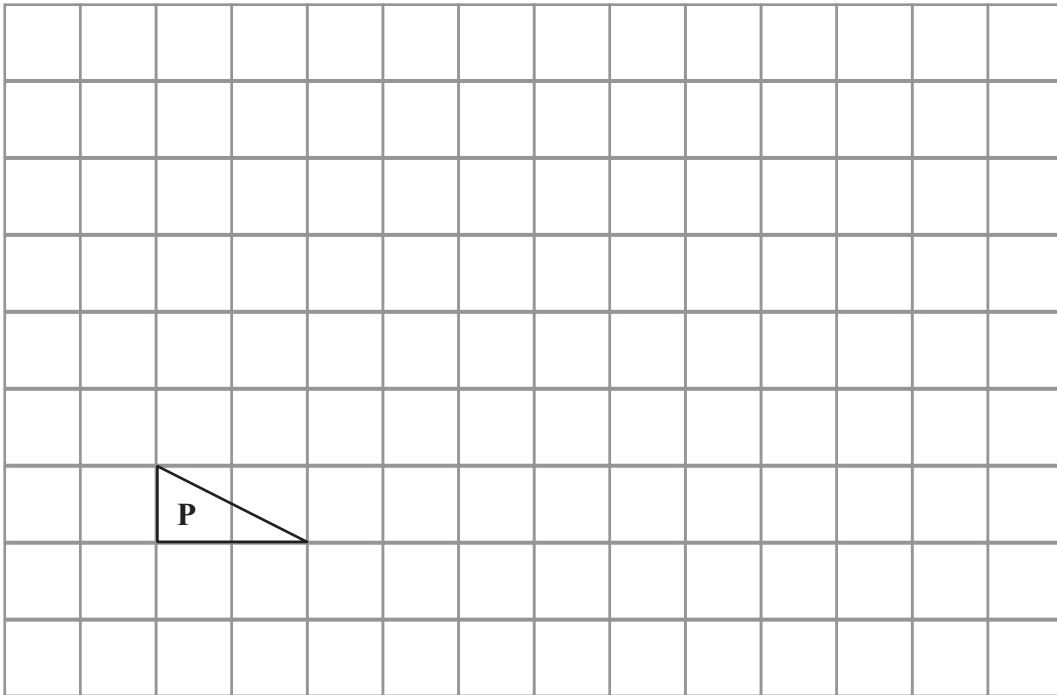
(2)

(Total 6 marks)

Q3



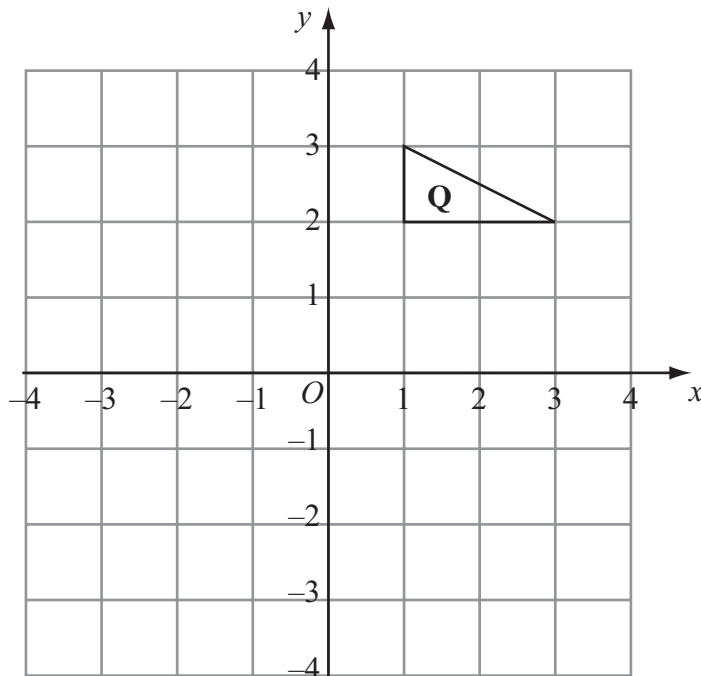
4.



Triangle **P** has been drawn on a grid.

(a) On the grid, draw an enlargement of the triangle **P** with scale factor 3

(2)



Triangle **Q** has been drawn on a grid.

(b) On the grid, rotate triangle **Q**  $90^\circ$  clockwise, centre  $O$ .

(3)

(Total 5 marks)

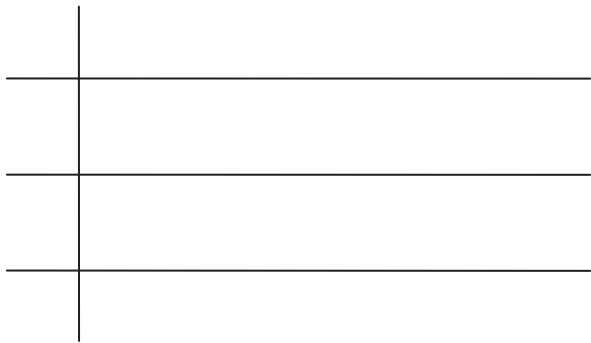
Q4



5. Here are the weights in grams, to the nearest gram, of 15 eggs.

33	46	41	54	51
38	60	44	55	51
62	55	52	37	63

(a) Complete the ordered stem and leaf diagram to show this information.  
You must include a key.



Key

**(3)**

Meg is going to pick at random one of the eggs.

(b) Work out the probability that this egg will have a weight of more than 45 grams.

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

**(Total 5 marks)**

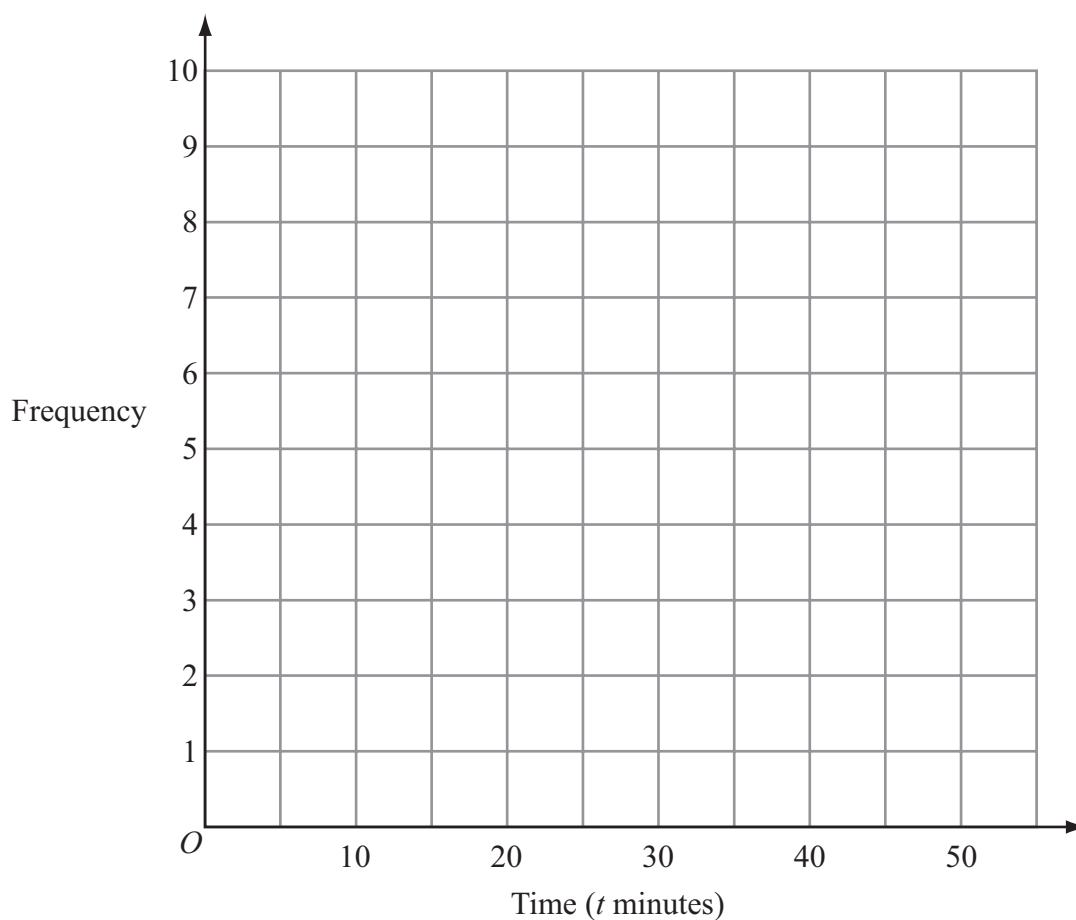
**Q5**



6. 30 students took a test.  
The table shows information about how long it took them to complete the test.

Time ( $t$ minutes)	Frequency
$0 < t \leq 10$	5
$10 < t \leq 20$	7
$20 < t \leq 30$	8
$30 < t \leq 40$	6
$40 < t \leq 50$	4

- (a) On the grid, draw a frequency polygon for this information.



(2)

- (b) Write down the modal class interval.

.....  
(1)

(Total 3 marks)

Q6



7. (a) Work out  $\frac{3}{8} + \frac{1}{4}$

Give your answer in its simplest form.

.....  
(2)

(b) Work out  $\frac{2}{3} \times \frac{4}{5}$

.....  
(2)

(c) Work out  $423 \times 12$

You **must** show **all** your working.

.....  
(3)

(Total 7 marks)

Q7



8. Simon wants to find out how much people spend using their mobile phone.

He uses this question on a questionnaire.

How much do you spend using your mobile phone?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£1–£5	£5–£10	£10–£15

(a) Write down **two** things that are wrong with this question.

1 .....

.....

2 .....

.....

(2)

(b) Design a better question for his questionnaire to find out how much people spend using their mobile phone.

You should include some response boxes.

(2)

Q8

(Total 4 marks)





9. (a) A solid cube has sides of length 5 cm.

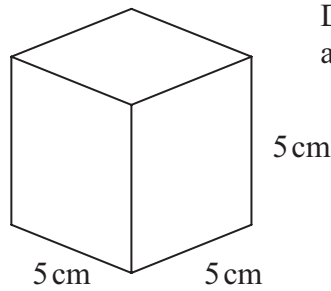


Diagram **NOT** accurately drawn

Work out the total surface area of the cube.  
State the units of your answer.

.....  
(4)

The volume of the cube is  $125 \text{ cm}^3$ .

(b) Change  $125 \text{ cm}^3$  into  $\text{mm}^3$ .

.....  $\text{mm}^3$   
(2)

The weight of the cube is 87 grams, correct to the nearest gram.

(c) (i) What is the minimum the weight could be?

..... grams

(ii) What is the maximum the weight could be?

..... grams  
(2)

(Total 8 marks)

Q9



10. (a) Simplify  $3a + 4c - a + 3c$

.....  
(2)

(b) Expand  $y(2y - 3)$

.....  
(1)

(c) Factorise  $x^2 - 4x$

.....  
(2)

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

.....  
(2)

(e) Solve  $3(x + 2) = 8$

$x =$  .....  
(2)

(Total 9 marks)

Q10



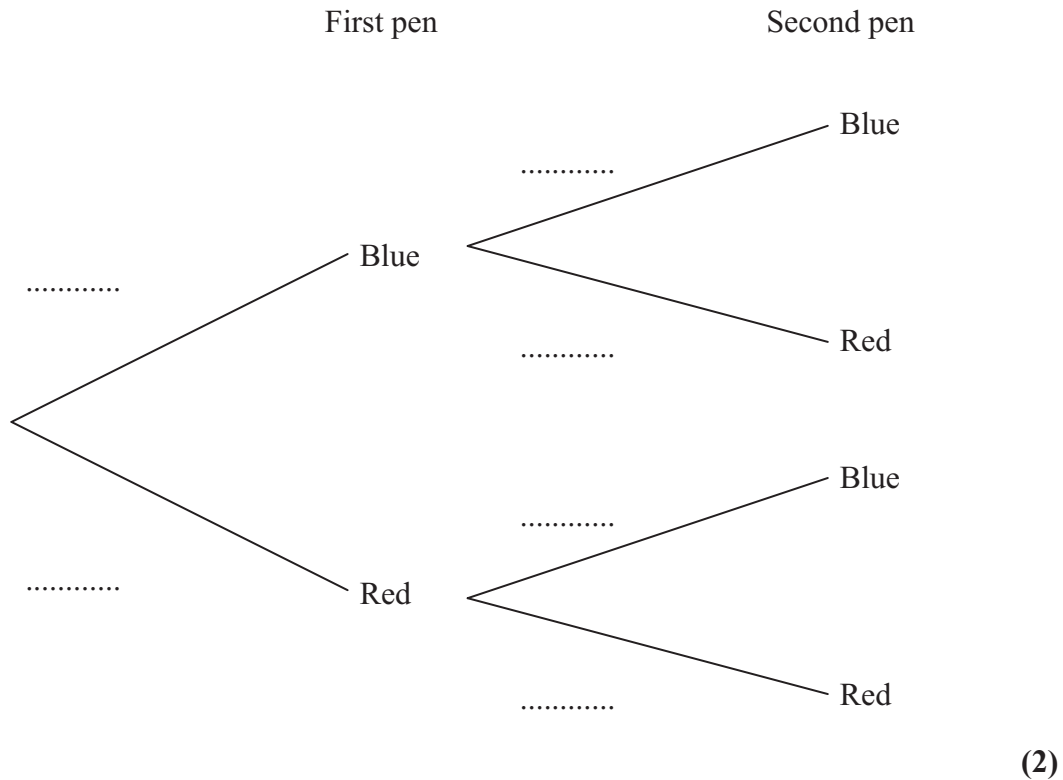
**11.**

Emma has 7 pens in a box.  
5 of the pens are blue.  
2 of the pens are red.

Emma takes at random a pen from the box and writes down its colour.  
Emma puts the pen back in the box.

Then Emma takes at random a second pen from the box, and writes down its colour.

(a) Complete the probability tree diagram.



(b) Work out the probability that Emma takes exactly one pen of each colour from the box.

.....

**(Total 5 marks)**

**Q19**



12.

Solve the simultaneous equations

$$4x + y = -1$$

$$4x - 3y = 7$$

$$x = \dots\dots\dots y = \dots\dots\dots$$

**(Total 3 marks)**

Q20

13.

Work out  $(2 + \sqrt{3})(2 - \sqrt{3})$

Give your answer in its simplest form.

.....

**(Total 2 marks)**

Q21

