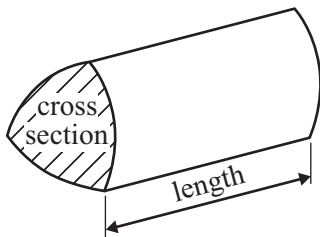


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

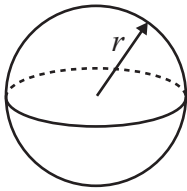
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



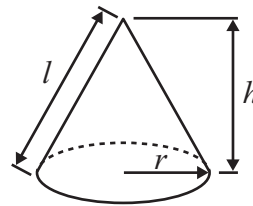
Volume of sphere = $\frac{4}{3}\pi r^3$

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

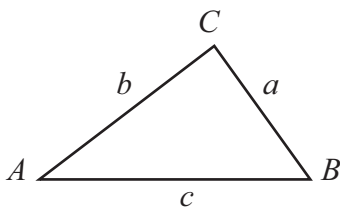


Volume of cone = $\frac{1}{3}\pi r^2 h$

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 = $\frac{1}{2} ab \sin C$

Answer ALL FIFTEEN questions. 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) 740×234

.....
(1)

(b) 74×2.34

.....
(1)

(Total 2 marks)

Q1

2. Work out an estimate for the value of

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

.....
(Total 3 marks)

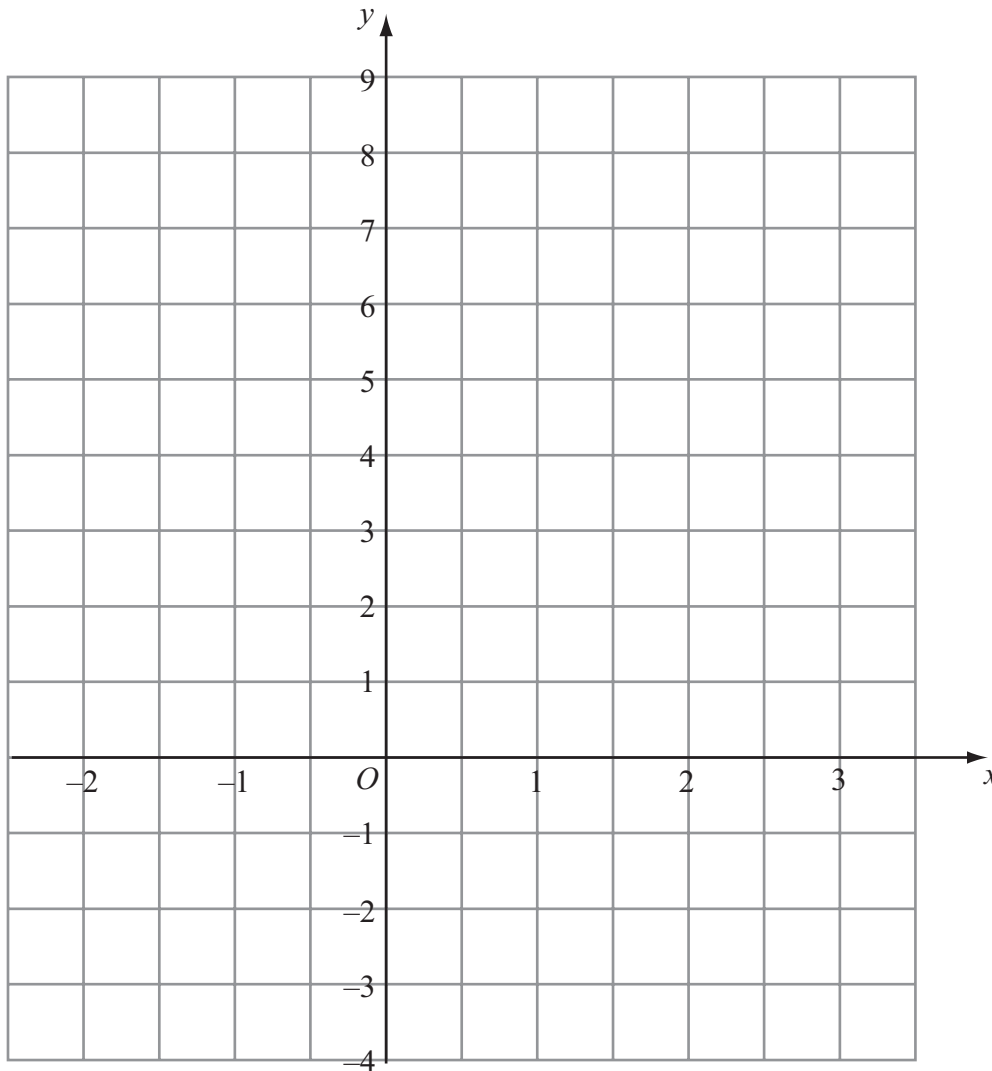
Q2

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)

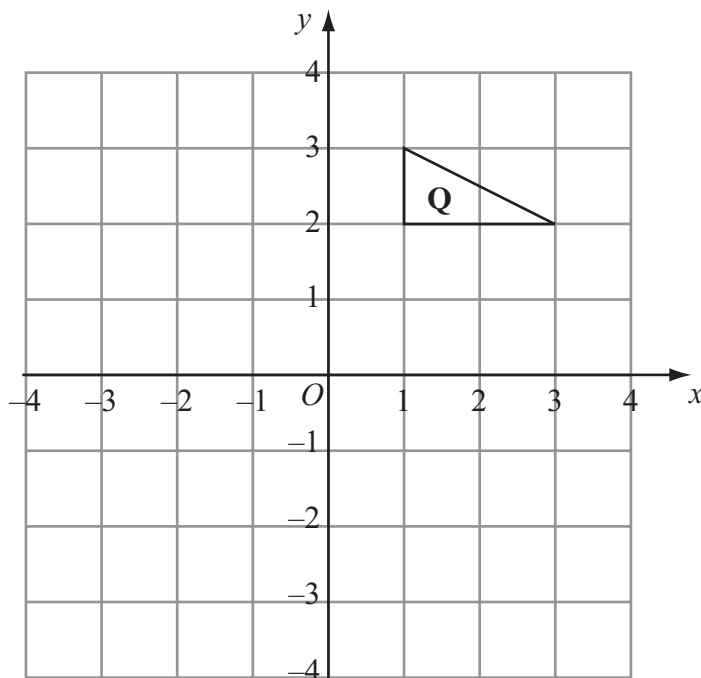
4.



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° clockwise, centre O .

(3)

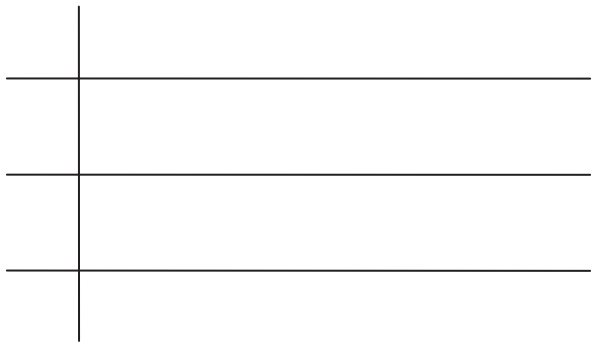
(Total 5 marks)

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)

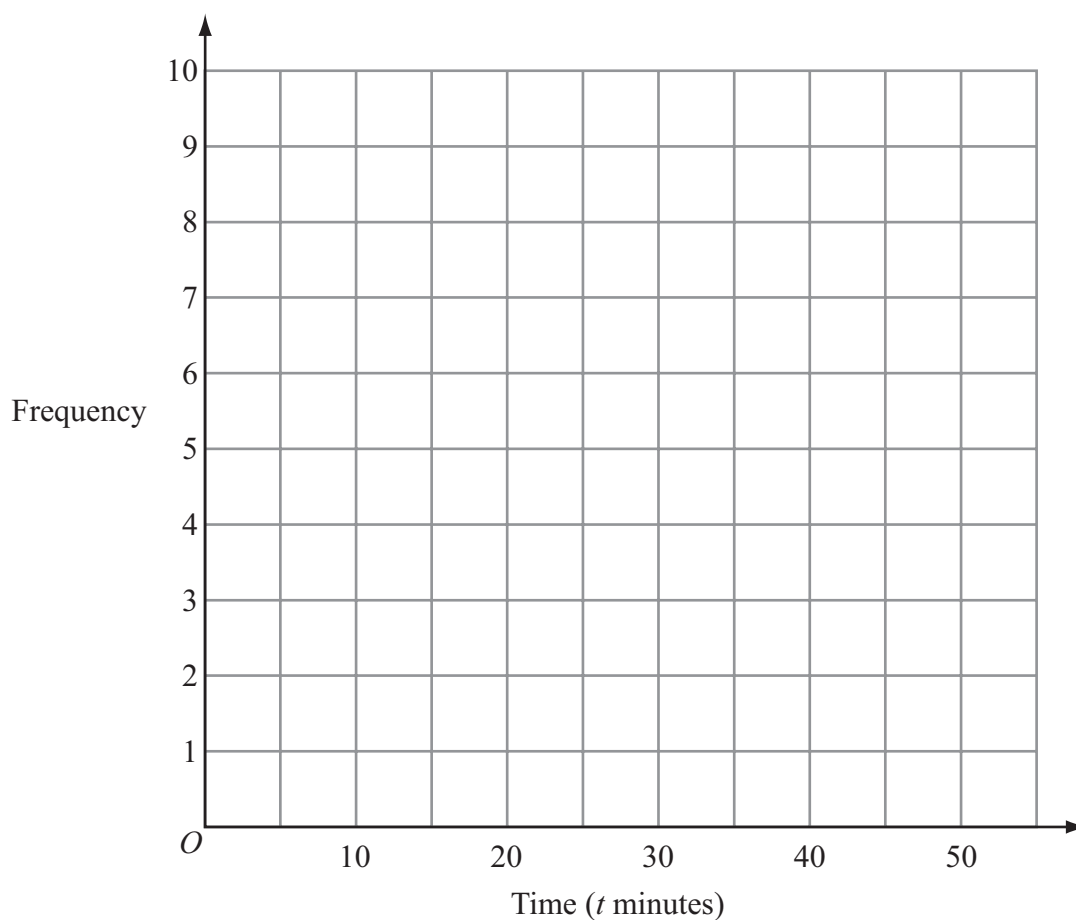
(Total 5 marks)

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 423×12

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) 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)

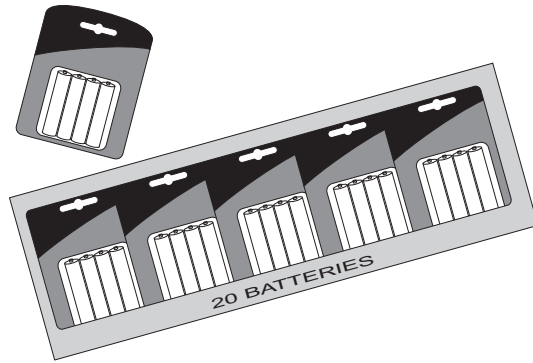
Q9

10. Batteries are sold in packets and boxes.

Each packet contains 4 batteries.
Each box contains 20 batteries.

Bill buys p packets of batteries
and b boxes of batteries.
Bill buys a total of N batteries.

Write down a formula for N in
terms of p and b .



.....
(Total 3 marks)

Q10

11. (a) Write in standard form 213 000

.....
(1)

(b) Write in standard form 0.00123

.....
(1)

(Total 2 marks)

Q11

12. (a) Write down the value of 5^0

.....
(1)

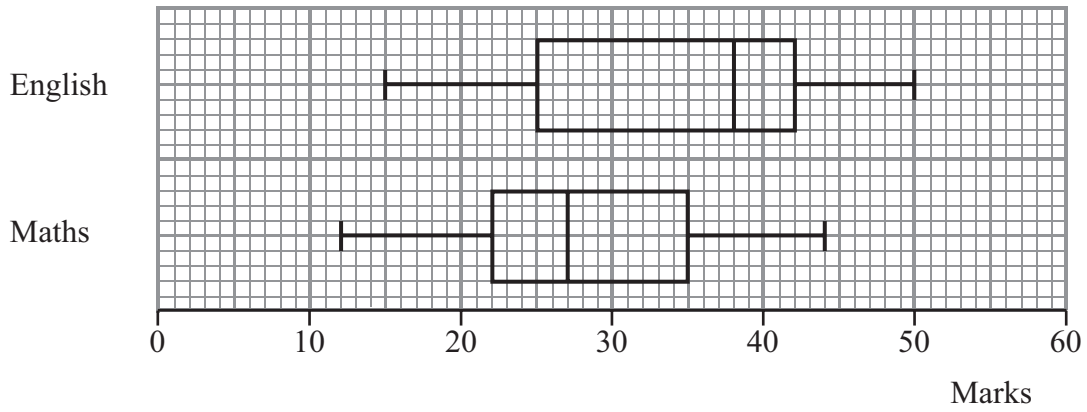
(b) Write down the value of 2^{-1}

.....
(1)

(Total 2 marks)

Q12

13. The box plots show the distribution of marks in an English test and in a Maths test for a group of students.



(a) What is the highest mark in the English test?

.....
(1)

(b) Compare the distributions of the marks in the English test and marks in the Maths test.

1
.....

2
.....

(2)

(Total 3 marks)

Q13

15. Solve the simultaneous equations

$$4x + y = -1$$

$$4x - 3y = 7$$

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

(Total 3 marks)

Q20