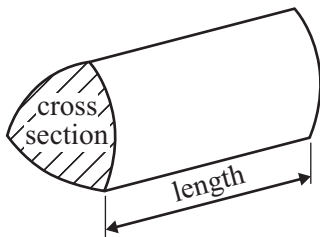


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

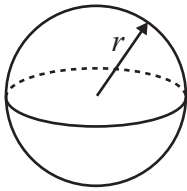
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



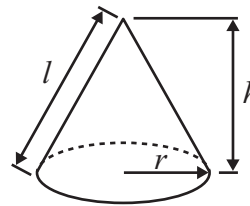
Volume of sphere = $\frac{4}{3} \pi r^3$

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

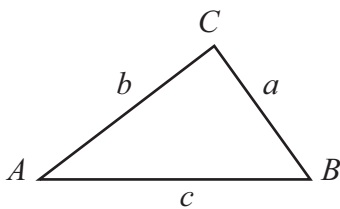


Volume of cone = $\frac{1}{3} \pi r^2 h$

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 EIGHTEEN questions. Write your answers in the spaces provided. You must write down all stages in your working.

1.

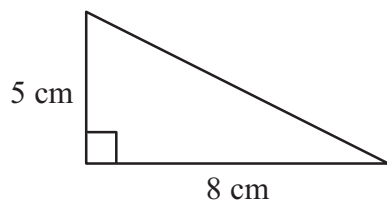


Diagram **NOT** accurately drawn

Work out the area of this right-angled triangle.

..... cm²
(Total 2 marks)

Q1

2. A spinner can land on red or blue or pink. The table shows the probabilities that the spinner will land on red or on blue.

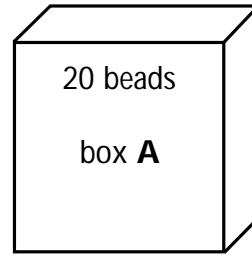
Colour	red	blue	pink
Probability	0.58	0.30	

Work out the probability that the spinner will land on pink.

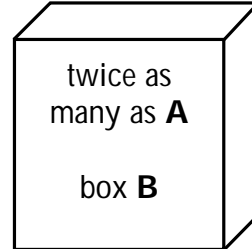
.....
(Total 2 marks)

Q2

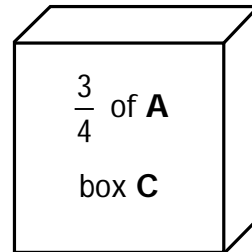
3. There are 20 beads in box **A**.



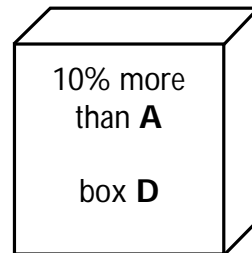
In box **B** there are twice as many beads as in box **A**.



In box **C** there are $\frac{3}{4}$ of the number of beads as in box **A**.



In box **D** there are 10% **more** beads than in box **A**.



Work out the **total** number of beads in the four boxes.

..... beads

(Total 4 marks)

Q3

4. Here is a list of ingredients to make melon sorbet for 6 people.

Melon Sorbet for 6 people	
800 g	melon
4	egg whites
$\frac{1}{2}$	lime
100 g	caster sugar

Terry makes melon sorbet for 18 people.

(a) Work out how much caster sugar he uses.

..... g
(2)

Hedley makes melon sorbet.
He uses 2 limes.

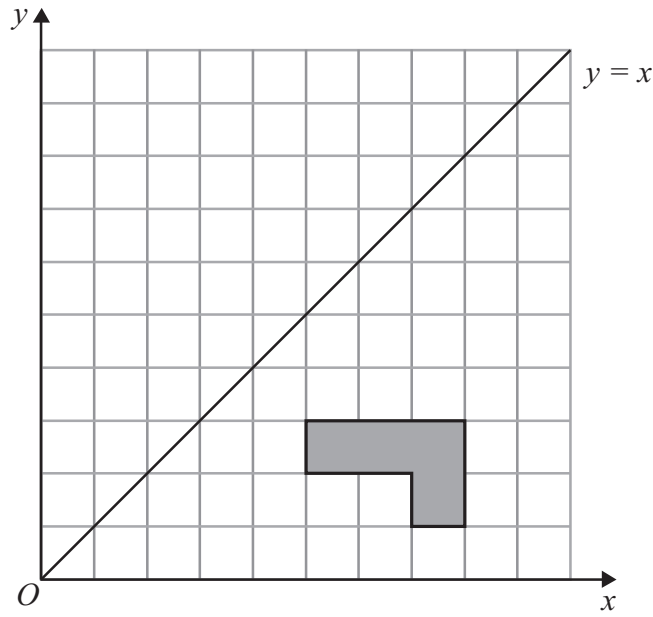
(b) Work out how many people he makes melon sorbet for.

.....
(2)

(Total 4 marks)

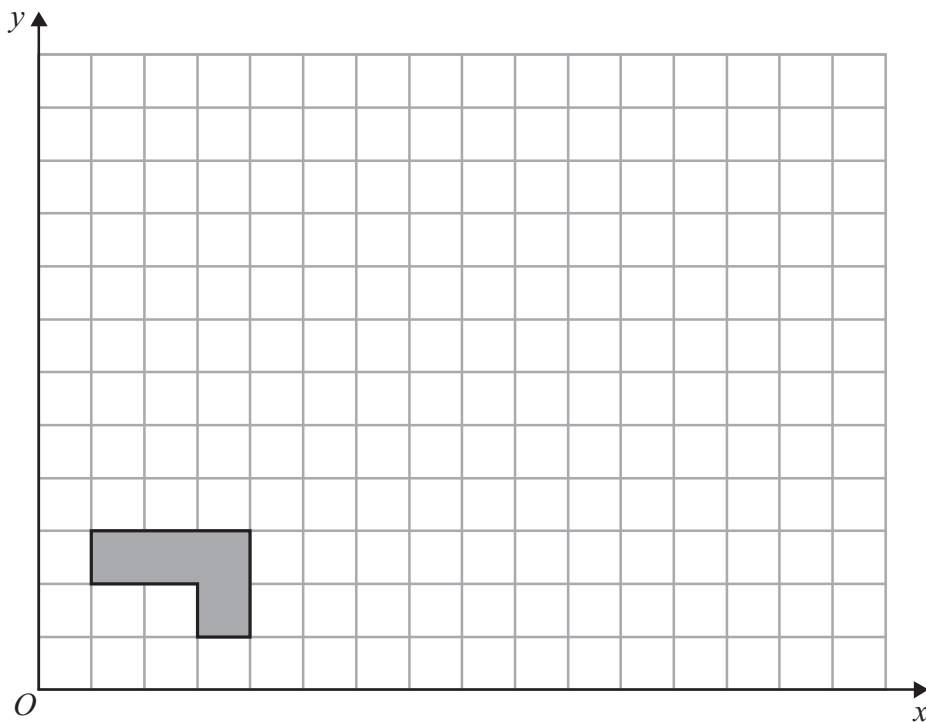
Q4

5.



(a) Reflect the shaded shape in the line $y = x$.

(2)



(b) On the grid, enlarge the shaded shape by a scale factor of 3, centre O .

(3)

(Total 5 marks)

Q5

6. (a) Simplify $7x + 2y - x + 3y$

.....
(2)

(b) Solve $2x + 3 = 10$

$x =$
(2)

(c) Simplify

(i) $c^5 \times c^6$

.....

(ii) $e^{12} \div e^4$

.....
(2)

(Total 6 marks)

Q6

7. Noah got 8 out of 20 in a test.

Write 8 out of 20 as a percentage.

..... %

(Total 2 marks)

Q7

8. The table shows some information about the ages, in years, of 60 people.

Age (in years)	Frequency
0 to 9	6
10 to 19	13
20 to 29	12
30 to 39	9
40 to 49	7
50 to 59	3
60 to 69	10

(a) Write down the modal class.

.....
(1)

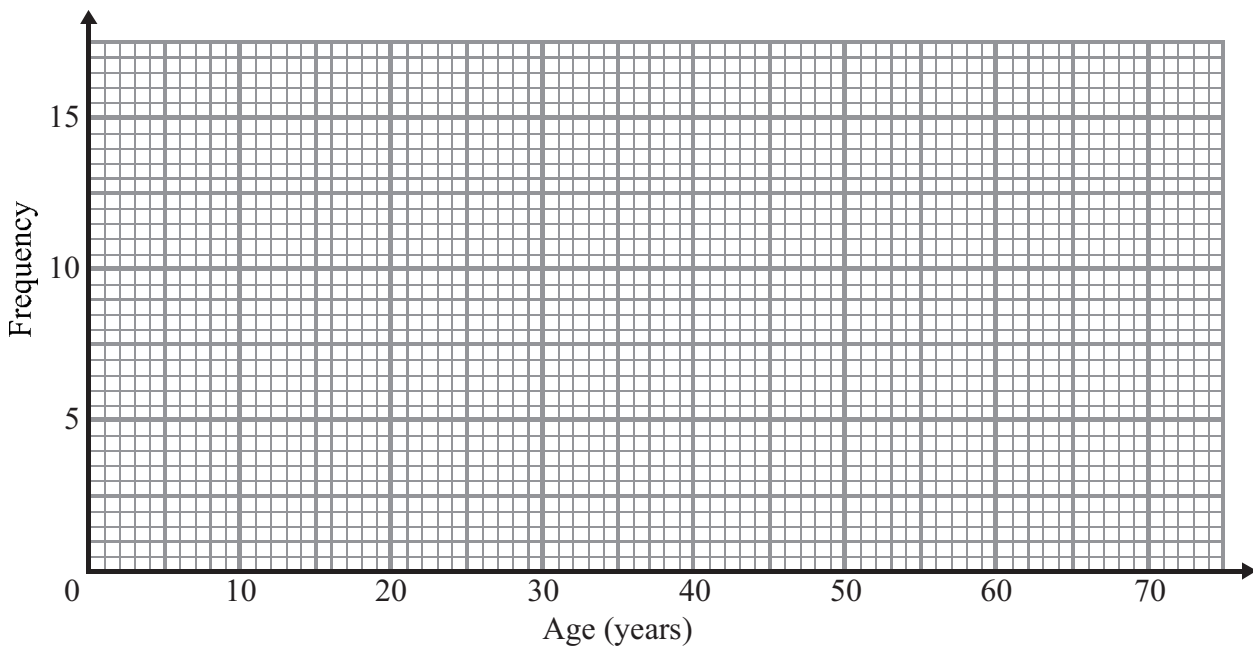
Luke says

‘The median lies in the class 30 to 39’

Luke is wrong.

(b) Explain why.

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



(c) On the grid, draw a frequency polygon for the information in the table.

(2)

(Total 4 marks)

9. Use your calculator to work out

$$\frac{13.7 + 5.86}{2.54 \times 3.17}$$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....

(Total 2 marks)

Q9

10. $-3 < k \leq 2$
 k is an integer.

(a) Write down all the possible values of k .

.....
(2)

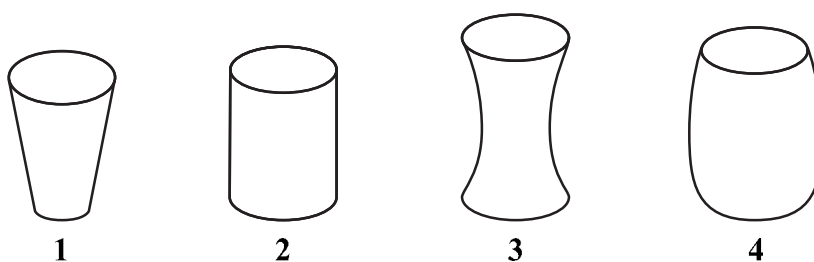
(b) Solve the inequality $\frac{2x}{3} < 10$

.....
(2)

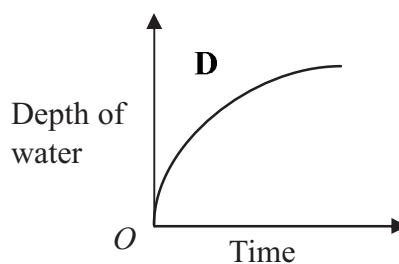
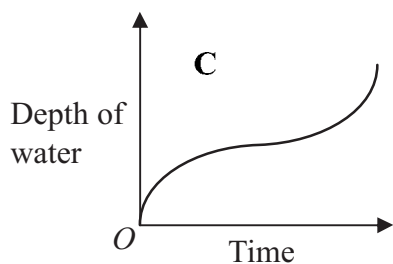
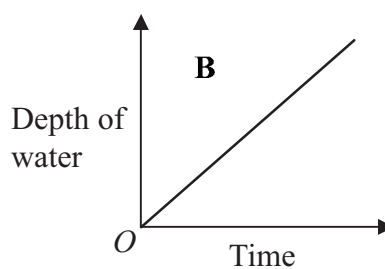
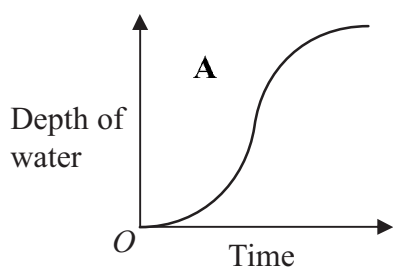
(Total 4 marks)

Q10

11. Here are four containers.
Water is poured into each container at a constant rate.



Here are four graphs.
The graphs show how the depth of the water in each container changes with time.



Match each graph with the correct container.

A and

B and

C and

D and

(Total 2 marks)

Q11

12. G and H are vertices of a cuboid.

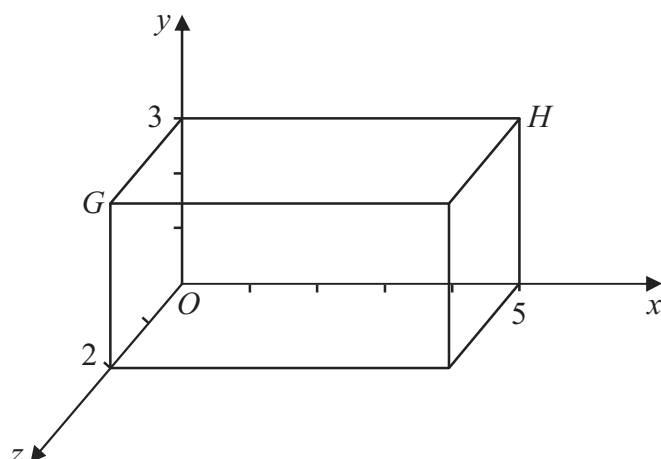


Diagram **NOT** accurately drawn

(a) Write down the coordinates of point G .

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

(b) Write down the coordinates of point H .

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

(Total 2 marks)

Q12

13. (a) Write 82 500 000 in standard form.

.....
(1)

(b) Work out $(5.2 \times 10^{-7}) \times (2.8 \times 10^{-9})$

Give your answer in standard form.

.....
(2)

(Total 3 marks)

Q13

14. (a) Write 56 as a product of its prime factors.

.....
(2)

(b) Find the Highest Common Factor (HCF) of 56 and 42

.....
(2)

(Total 4 marks)

Q14

15.

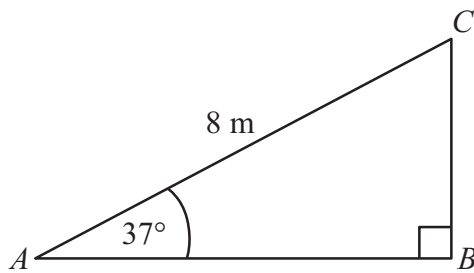


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.

AC = 8 m.

Angle *CAB* = 37°.

Calculate the length of *AB*.

Give your answer correct to 3 significant figures.

..... m

(Total 3 marks)

Q15

16.

There are 100 teachers at Maria’s school.
 Maria found out the age of each teacher.

The table gives information about her results.

Age (A years)	Frequency
$20 < A \leq 30$	26
$30 < A \leq 40$	35
$40 < A \leq 50$	21
$50 < A \leq 60$	12
$60 < A \leq 70$	6

(a) Complete the cumulative frequency table.

Age (A years)	Cumulative Frequency
$20 < A \leq 30$	26
$20 < A \leq 40$	
$20 < A \leq 50$	
$20 < A \leq 60$	
$20 < A \leq 70$	

(1)

(b) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

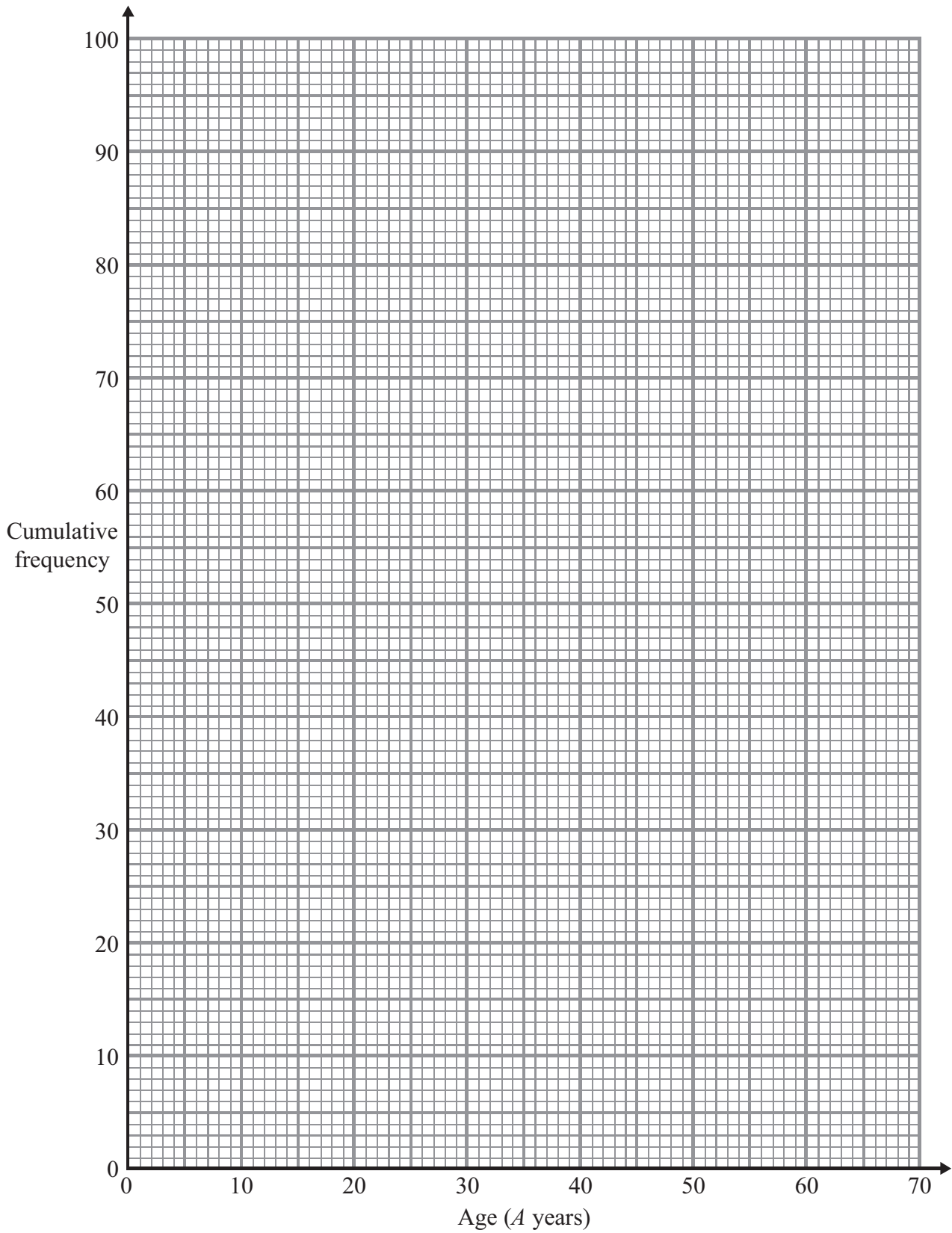
(c) Use your graph to find an estimate for the median age.

..... years
 (1)

(d) Use your graph to find an estimate for the number of these teachers who are **older** than 56 years old.

.....
 (2)

Leave blank



(Total 6 marks)

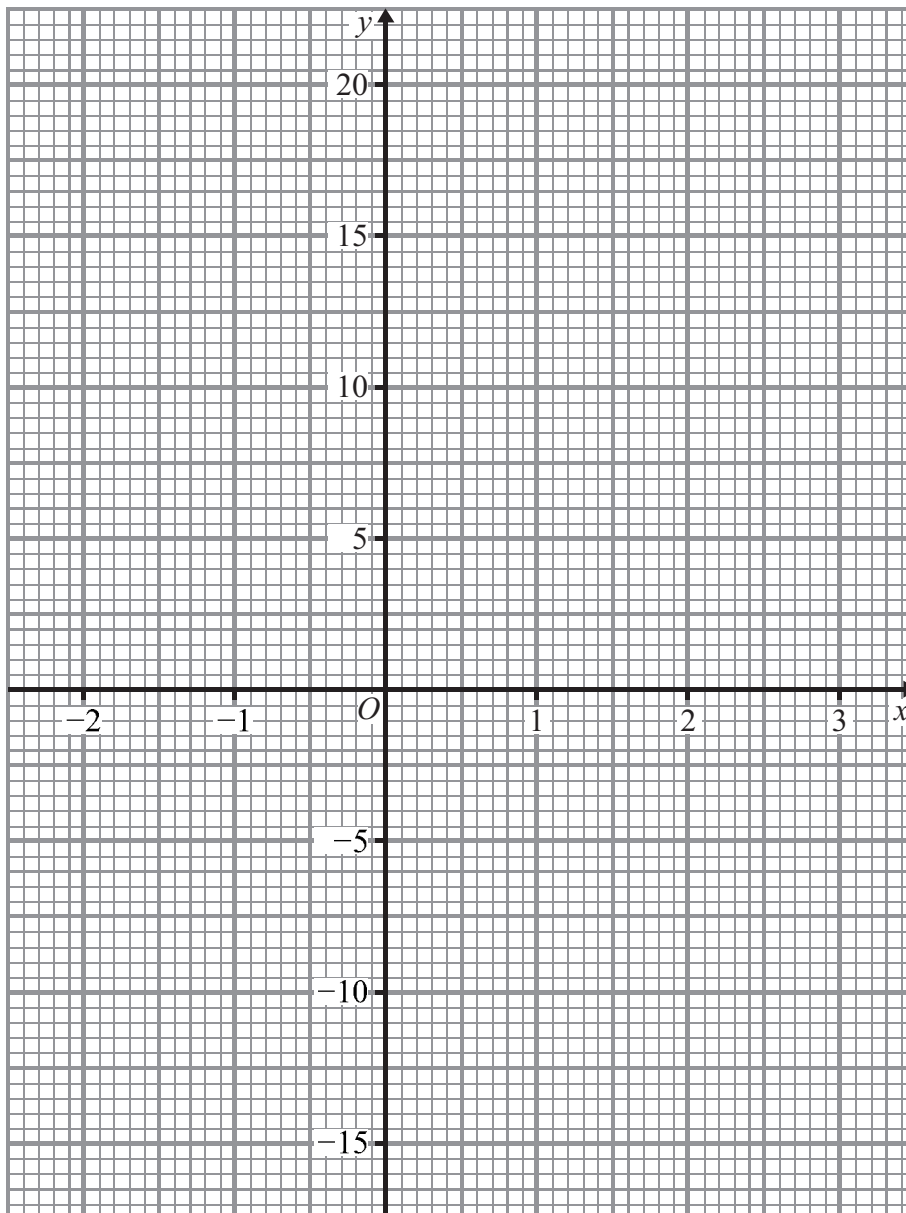
Q16

17. (a) Complete the table of values for $y = x^3 - 7$

x	-2	-1	0	1	2	3
y		-8				20

(2)

(b) On the grid, draw the graph of $y = x^3 - 7$ for values of x from -2 to 3



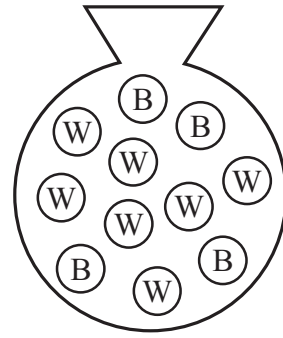
(2)

(Total 4 marks)

Q17

18. There are 11 buttons in a bag.

7 buttons are white.
4 buttons are black.



Harley takes a button at random from the bag, and keeps it.

She now takes another button at random from the bag.

Work out the probability that Harley takes a button of each colour.

Q18

.....
(Total 3 marks)