KING'S COLLEGE JUNIOR SCHOOL

WIMBLEDON

TRANSFER PAPER

SPECIMEN

MATHEMATICS 2
(Calculator)

Time: 60 minutes

Name: _____

Please read this information before the examination starts

- **All** questions should be attempted.
- A completely correct answer will receive **no** marks unless you show all your working. Give the correct units when necessary.
- Calculators are allowed
- Give your answers to 3 significant figures if necessary and not otherwise specified within the question.
- If you have time at the end, check your answers carefully.

1. a) Multiply out and simplify $6a - 7b - 3(4b - a)$

.....

(2 marks)

b) Factorise completely $16a^2 - 20a$

.....

(2 marks)

c) Solve $\frac{6a}{7} - 3 = 10$

.....

(2 marks)

d) Solve $\frac{4a - 3}{2} = 5$

.....

(2 marks)

e) Solve $3(2c - 5) = 8 - 4c$

.....

(2 marks)

f) Solve $5m + 8 < -3$

.....

(2 marks)

g) List the highest 3 integers for which part f) is true

.....

(2 marks)

h) Solve $2 > 9 - 5x$

.....

(2 marks)

2. a) Rewrite all of the numbers in the following expression correct to 1 significant figure:

$$\frac{154}{0.1699 \times 12.5}$$

(2 marks)

.....

b) Calculate your answer to part a)

(2 marks)

.....

c) Writing down all the figures shown on your calculator, find the value of

$$\frac{154}{0.1699 \times 12.5}$$

(2 marks)

.....

d) Write your answer to c) correct to 2 significant figures

(1 mark)

.....

e) Write your answer to c) correct to 2 decimal places

(1 mark)

.....

3. In this question you are told that 1 mile = 1.6 kilometres

a) Alice runs 6.5 miles. How many kilometres does she run?

(1 mark)

.....

b) Beth cycles 17.3 kilometres to school. How many miles is this?

(1 mark)

.....

4. A circular swimming pool has a diameter of 10m.

a) Find the circumference of pool.

.....

(2 marks)

b) The swimming pool is 3.2m deep.

Find the volume of the water in the pool in metres cubed.

.....

(2 marks)

c) If 1 cubic metre = 1000 litres, convert your answer in b) to litres.

.....

(1 mark)

d) Find the area of a semicircle which has a radius of 7cm.

.....

(3 marks)

5. Solve the following simultaneous equations, showing all of your working out:

$5a - 4b = -3$

$7a - 3b = 1$

x= .....

y= .....

(4 marks)

Turn Over

6. Cathy has y sweets.

a) Debbie has 3 times as many sweets as Cathy.

How many sweets does Debbie have in terms of y?

.....

(1 mark)

b) Edward has 5 fewer sweets than Cathy.

How many sweets does Edward have in terms of y?

.....

(2 marks)

c) Write down an expression, in terms of y for the number of sweets Cathy, Debbie and Edward have in terms of y.

Simplify your answer.

.....

(2 marks)

d) Between them the three children have 75 sweets.

Form an equation, in terms of y to show this. Then solve your equation.

.....

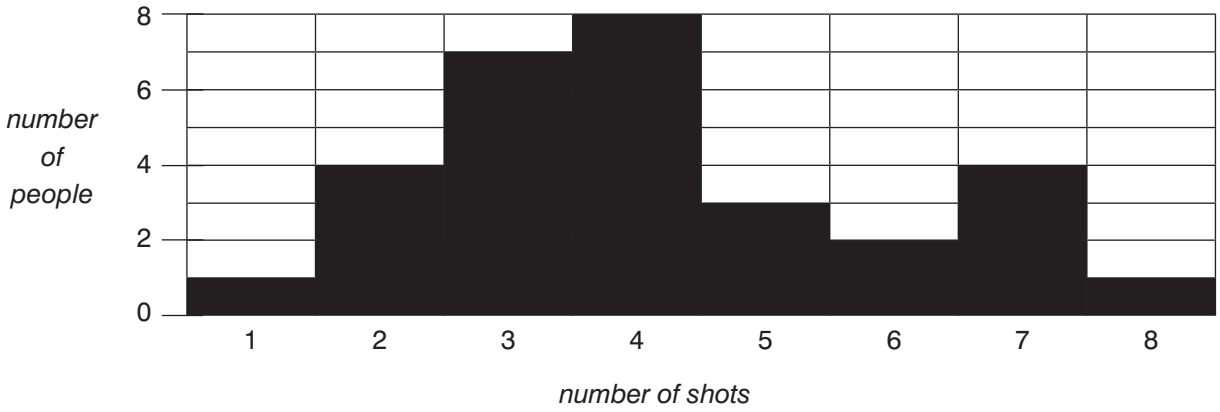
(2 marks)

e) How many sweets does Debbie get?

.....

(2 marks)

7.



The graph shows the number of shots various people took before they knocked off a coconut at a coconut shy, for example 8 people took 3 shots.

a) If everybody only had one go each, then how many people took part in the coconut shy?

..... *(1 mark)*

b) How many shots were taken in total at the coconut shy?

..... *(1 mark)*

c) What is the modal number shots taken at the coconut shy?

..... *(1 mark)*

d) What was the median number of shots taken per person?

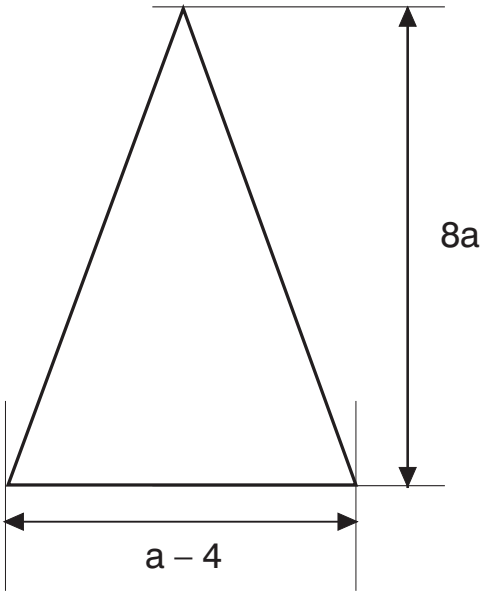
..... *(2 marks)*

e) What was the mean number of shots taken per person?

..... *(2 marks)*

Turn Over

8. The height of the triangle is (8a) cm and the base is (a − 4) cm.



a) Write down an expression for the area of the triangle.

.....

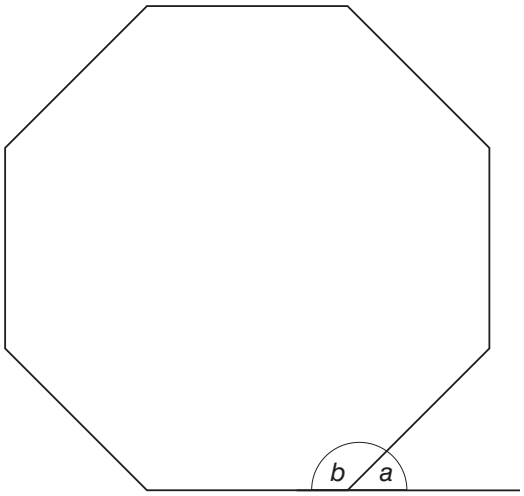
(2 marks)

b) Simplify your expression by multiplying out the brackets.

.....

(2 marks)

9. A regular octagon is shown below.



a) Find the value of the exterior angle, ‘a’.

.....

(2 marks)

b) Find the value of the interior angle, ‘b’.

.....

(1 mark)

c) Find the sum of all of the interior angles in the octagon.

.....

(1 mark)

d) Another regular shape has exterior angles which all measure 15°.
How many sides does this shape have?

.....

(2 marks)

Turn Over

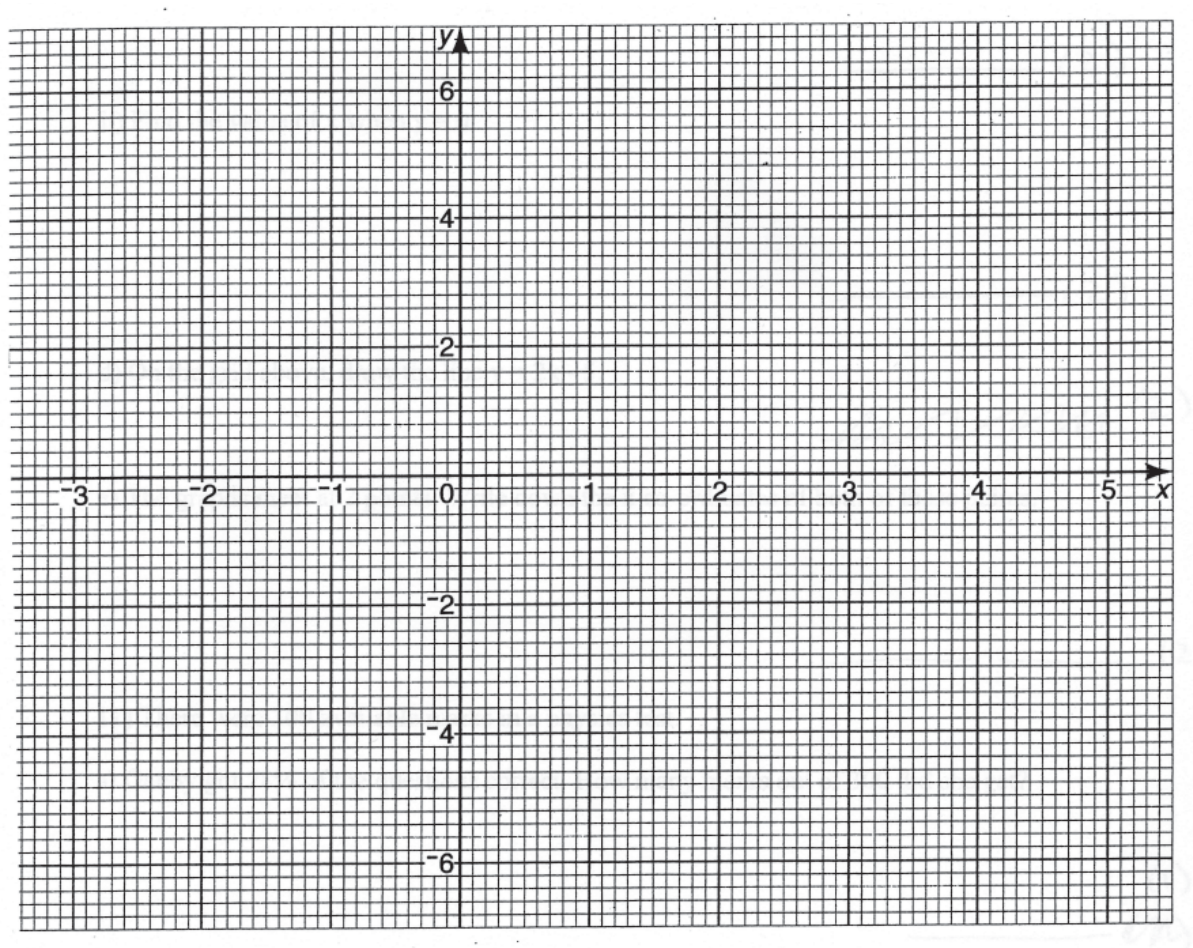
10. Given that $y = x^2 - x - 6$

a) Complete the table below:

x	− 3	− 2	− 1	0	1	2	3	4
x^2		4		0				16
− x		2		0				− 4
− 6		− 6		− 6				− 6
y		0		− 6				6

(3 marks)

b) On the grid below, draw the graph of $y = x^2 - x - 6$.



c) By looking at your graph, write down the minimum possible y-value of $y = x^2 - x - 6$ correct to 1 decimal place.

(2 marks)

.....

c) When $y = 2x - 5$

i) Find the value of y when $x = 0$.

..... *(2 marks)*

ii) Find the value of x when $y = 0$.

..... *(2 marks)*

d) On the grid on the left, draw the line $y = 2x - 5$.

(2 marks)

e) The graphs meet at 2 points.

Write down the x co-ordinates of both of these points.

x= ..... , x= ..... *(2 marks)*

11. There were 300 available marks in a physics test.

a) Gabby got 78% of the questions correct.

How many marks out of 300 did she get?

..... *(2 marks)*

b) Hattie lost a total of 60 marks. Imogen lost a total of 130 marks.

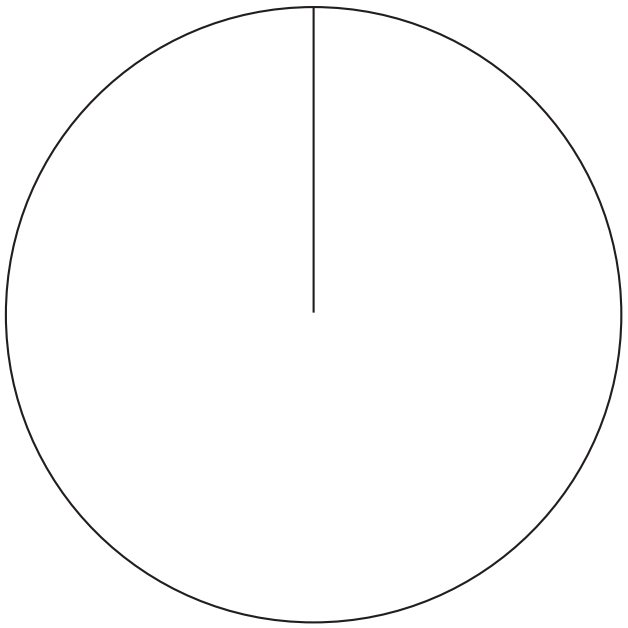
What percentage did they achieve on average in their tests?

..... *(2 marks)*

12. A group of pupils were asked which type of crisps they preferred.

12 preferred salt and vinegar
5 preferred cheese and onion
23 preferred prawn cocktail
20 preferred scampi and lemon

a) Draw an accurate, fully labelled pie chart to show this information.



(2 marks)

b) What fraction of people preferred scampi and lemon?

.....

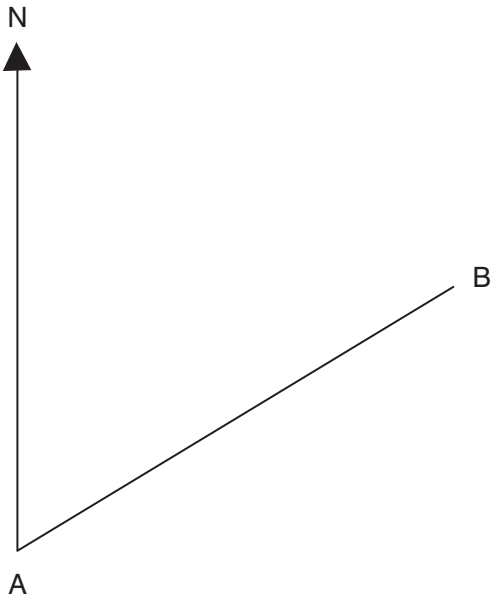
(1 mark)

c) Out of the people who preferred the traditional salt and vinegar or cheese and onion flavours, what percentage of them preferred cheese and onion?

.....

(1 mark)

13.



a) Measure the bearing of B from A.

..... *(1 mark)*

b) What is the bearing of A from B?

..... *(1 mark)*

c) Point C is 3 cm North of B.
Amy stands on point A and Charlie stands on point C.
On this map, 1 cm represents 500m.

How many kilometres apart are Amy and Charlie?
(Measure the shortest distance between them).

..... *(2 marks)*

14. Two fair 6 sided dice are thrown and their scores are multiplied together to give a score called M.

a) Complete the table to show all of the possibilities of M.

M	1	2	3	4	5	6
1						
2			6			
3						
4						
5		10				
6				24		

(2 marks)

Give your answers as fractions in their lowest forms to the following questions.

What is the probability that the score M is:

b) Even?

(2 marks)

.....

c) More than 30 (but not equal to 30)?

(1 mark)

.....

d) A prime number? (One is not a prime number)

(2 marks)

.....

e) If we definitely know that the score on the first dice is a 3, what is the probability that the score M is greater than 19?

(2 marks)

.....

f) Two other dice are now thrown.
What is the probability that the sum of their scores is a multiple of 5?

(2 marks)

.....

END