ALDENHAM SCHOOL

13 + Entrance Paper
SAMPLE PAPER

Mathematics

Length of Examination – 1 hour

Do not open until you are told to do so

Surname: …… School:……

First name: ……... Age: Years …… Months ……..

INSTRUCTIONS FOR CANDIDATES

- Write your answers in the spaces provided in this booklet
- Show sufficient method to show how you obtained your answers
- Calculators MUST NOT be used in any question.
- Rulers may be used.

Work steadily through the paper doing as much as you can straight away, then go back to work at the more difficult questions.

Total Number of Marks: 100

1. Work out the following calculations.

1a (24 – 10) x 2

.....
(1 mark)

1b 12 + 3 x 8

.....
(1 mark)

2. Owen buy some cricket pads for £19.56 and a helmet for £24.38.

2a How much does Owen spend in total?

.....
(1 mark)

2b He wishes to buy a cricket bat costing £148.

He has £30 saved already and his parents say they will pay half of the cost.

He can save £10 per month. How many months will he have to wait until he can afford the bat?

.....
(2 marks)

3. Circle the number which is not a multiple of 3?

24 **180** **201** **301**

.....
(1 mark)

4. Mr Collins bought 24 packs of biscuits each containing 15 biscuits.

How many biscuits did he buy in total?

…….....
(2 marks)

5. Write down a number which is a multiple of 8 and a multiple of 12.

.....
(1 mark)

6. Write the numbers below in order, starting with the smallest.

6a -3, 3.5, 0, -14, 25, 4

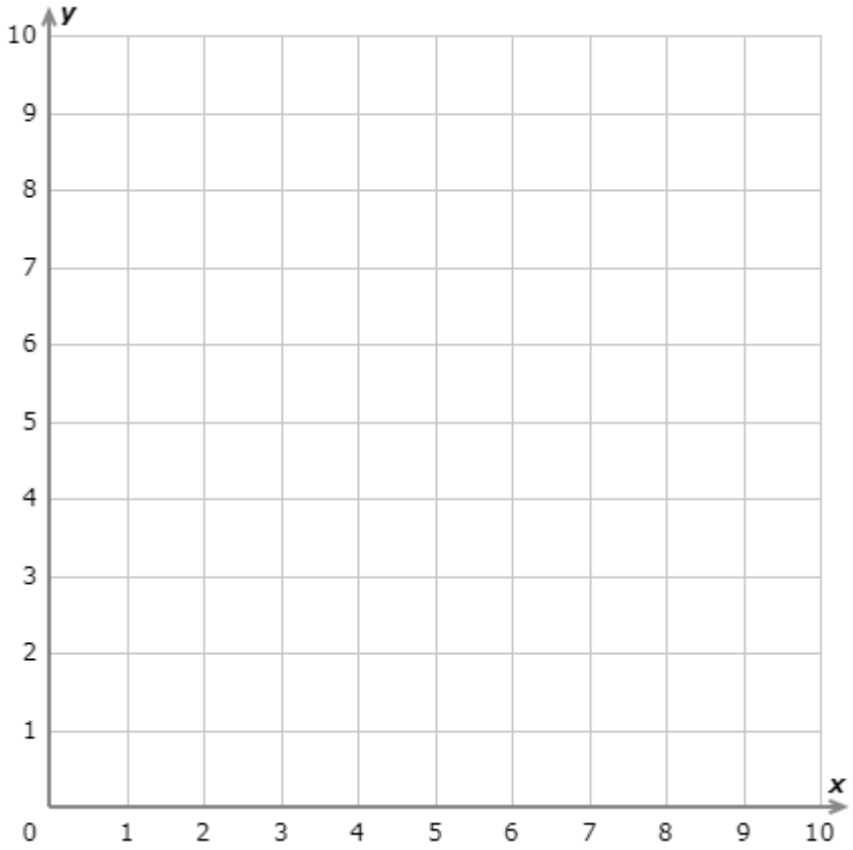
……..

6b 5m 240cm 80cm 4500mm

……..

(2 marks)

7. You start at (7, 3) and move 6 squares left and 4 units up. Where do you end up?



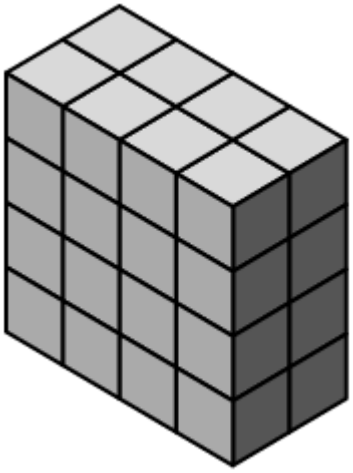
(…… , ……)
(2 marks)

8. Izzy has a new necklace. 12 of the 60 beads are blue.

What percentage of the beads are blue?

.....
(1 mark)

9. Draw an accurate net of this shape.



(2 marks)

10. A crate can hold 12 glasses.

What is the smallest number of crates needed for 100 glasses?

……
(1 mark)

11. Simplify the expressions below. (x means multiply)

11a c + 4m - 7m

……
(1 mark)

11b 2t x 5t

……
(1 mark)

11c 3a + 5(4a – 2)

……
(2 marks)

12. 6 litres of water is to be shared equally between 15 bottles. How much water will there be in each bottle?

.....

(2 marks)

13a Look at the following 10 numbers

7 5 7 6 6 4 5 3 4 4

How would the mode change if one of the 6s was changed to a 4?
Circle your answer.

increase	decrease	no change

(1 mark)

13b Look at the following 10 numbers

88 59 80 77 56 85 64 66 76 59

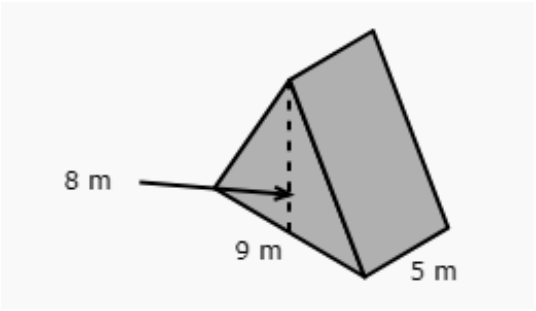
How would the median change if the number 64 was added to the list?
Circle your answer.

increase	decrease	no change

(1 mark)

14. Find the volume of the solid below.

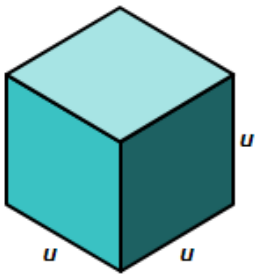
Include the units in your answer.



……
(3 marks)

15. The volume of this cube is 729 cubic metres. What is the value of u?

Circle your answer.



7 m	8 m	9 m	13 m

……
(1 mark)

16a Work out:

$$2\frac{3}{4} + 1\frac{2}{5}$$

……
(2 marks)

16b Work out and simplify fully.

$$\frac{4}{5} \div \frac{2}{3}$$

……
(2 marks)

17. Write 60 as the product of its prime factors.

……

(2 marks)

18. Solve the following equations:

18a) $4n - 8 = 32$

n = ...

(2 marks)

18b) $6p + 5 = 40 - p$

p = ...

(3 marks)

18c) $5c^2 = 80$

c = ...

(2 marks)

19. A store owner bought a bag for £120 and sold it for £150.

What percentage profit is this?

.....

(2 marks)

20. Factorise the expression $12 – 4x$

……
(1 mark)

21a In a bag there are blue and yellow marbles.

There are 20 marbles in total and 12 are blue.

If a marble is picked out of the bag at random, what is the probability that it is yellow?

……
(1 mark)

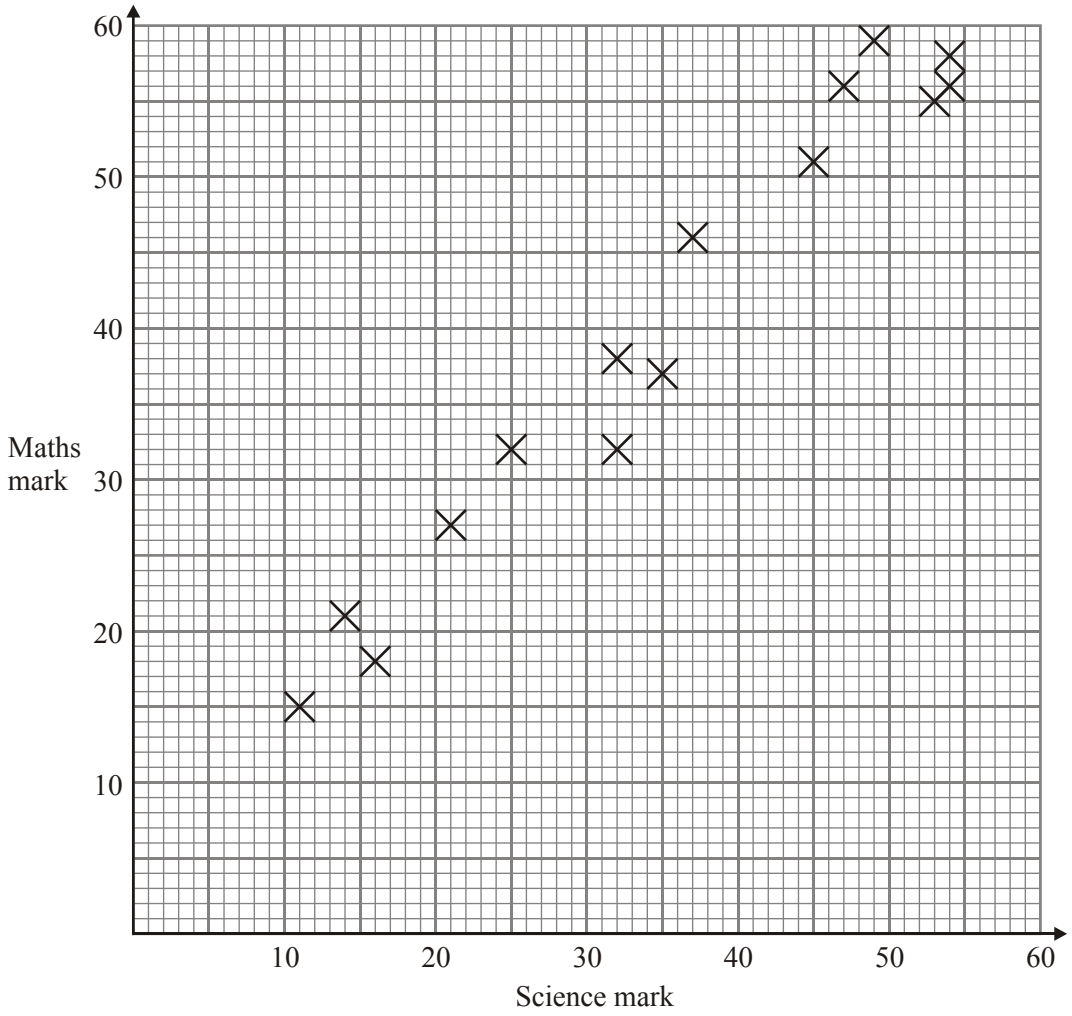
21b If the experiment is repeated 50 times what is the expected number of yellow marbles which would be chosen?

……
(1 mark)

21c If you were to pick a marble, replace it, then pick another, what is the probability both marbles would be yellow?

……..
(1 mark)

22. Look at the scattergraph below linking maths and science test scores.



22a What type of correlation does the graph show.

.....

(1 mark)

22b By drawing a line of best fit, predict the value for a maths score for a student whose science score was 38.

.....

(1 mark)

23. ***P* = 2(a + b)**

23a Work out the value of *P* when a = 4 and b = 12

P = ...

(2 marks)

23b Work out the value of a if P = 16 and b = 3

a = ...

(2 marks)

24. Here are the ingredients for fudge.

Fudge

Ingredients for **6** people

600 g of sugar
12 g of butter
480 g of condensed Milk
90 m/ of milk

Work out how much condensed milk is needed to make fudge for 10 people.

.....

(3 marks)

25. Mika can eat 21 hot dogs in 6 minutes.

How many minutes would it take her to eat 35 hot dogs if she can keep up the same pace?

You must show your working.

.....

(2 marks)

26. A box contains counters that are red, blue, yellow or green.
The table shows some information about picking a counter at random.

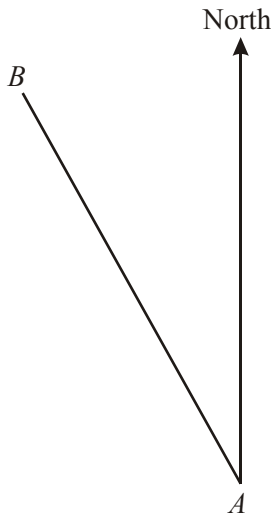
	red	blue	yellow	green
Probability	x	0.25	0.35	3x

Work out the value of x, the probability of choosing a red counter.

.....

(2 marks)

27.



27a Measure and write down the bearing of *B* from *A*.

.....°

(1 mark)

27b Estimate on the diagram, the position of a line on a bearing of 110° from *A*.

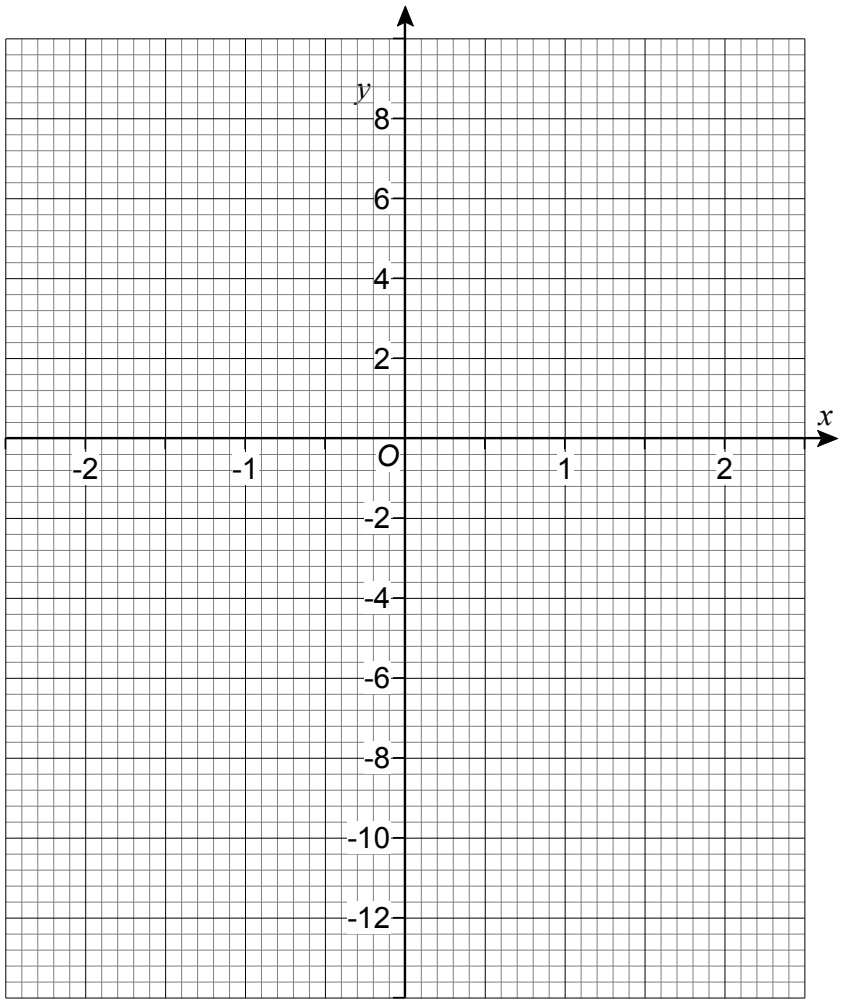
(1 mark)

28a Complete the table of values for the graph $y = 2x - 4$

(1 mark)

x	–2	–1	0	1	2
y			–4	-2	

28b On the grid, draw the graph of $y = 2x - 4$ for values of x from –2 to 2

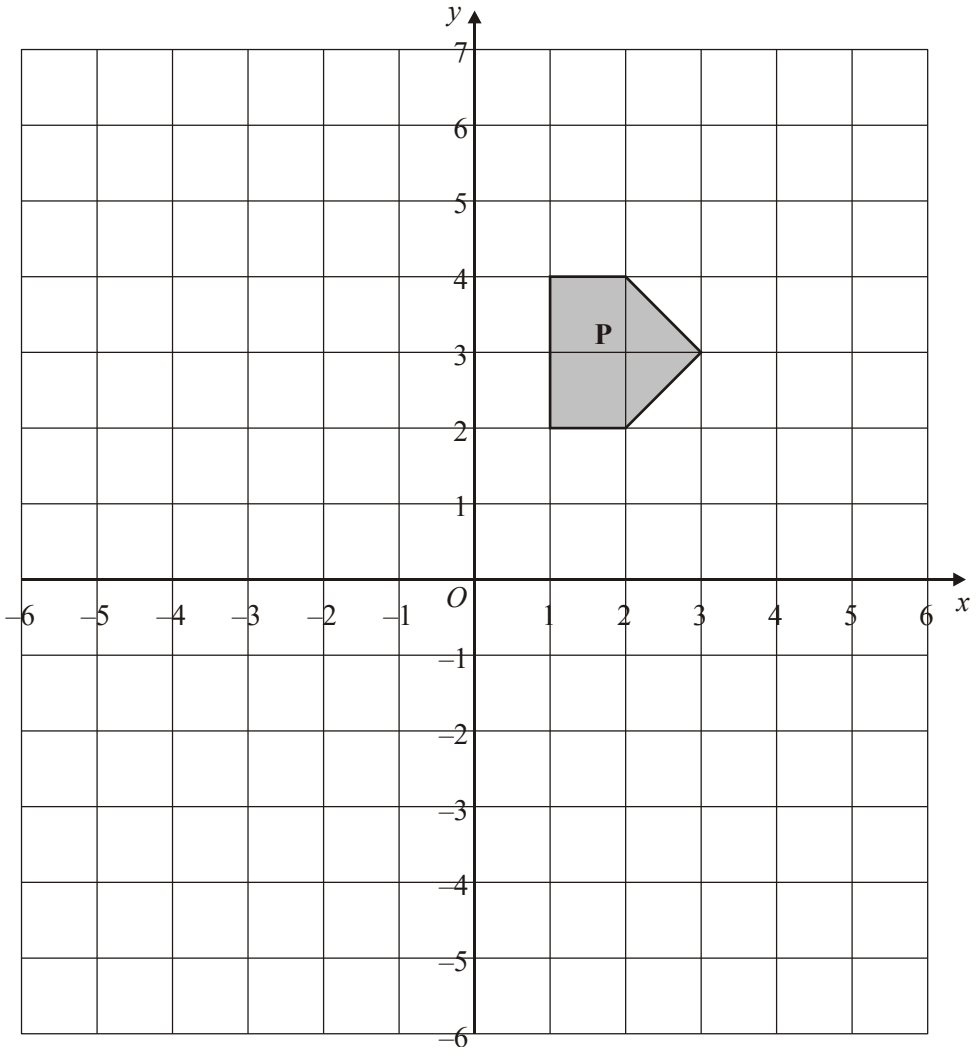


(2 marks)

28c Draw the line y = x on the axes above.

(1 mark)

29.



29a Rotate shape P 90° clockwise about the point (0,2). Label the new shape Q

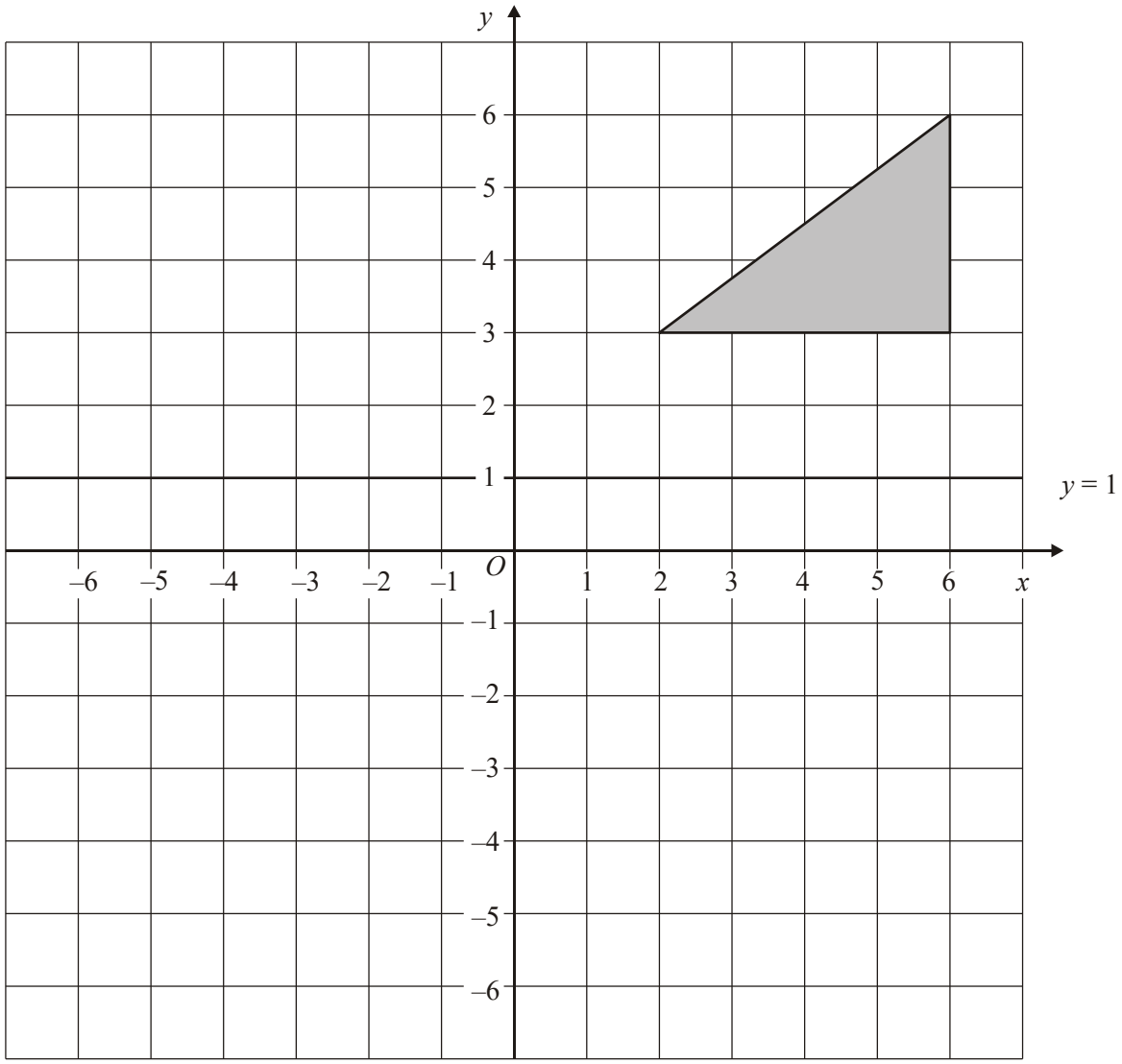
(2 marks)

29b Translate triangle Q by $\begin{pmatrix} 3 \\ -6 \end{pmatrix}$

Label your answer R.

(1 mark)

30.



Reflect the shape in the line x= -1

(2 marks)

31. The table shows the goals scored scored goals for the school hockey team last month.

Goals scored	Number of students	
1	9	
2	3	
3	5	
4	3	

31a What was the modal number of goals scored?

.....
(1 mark)

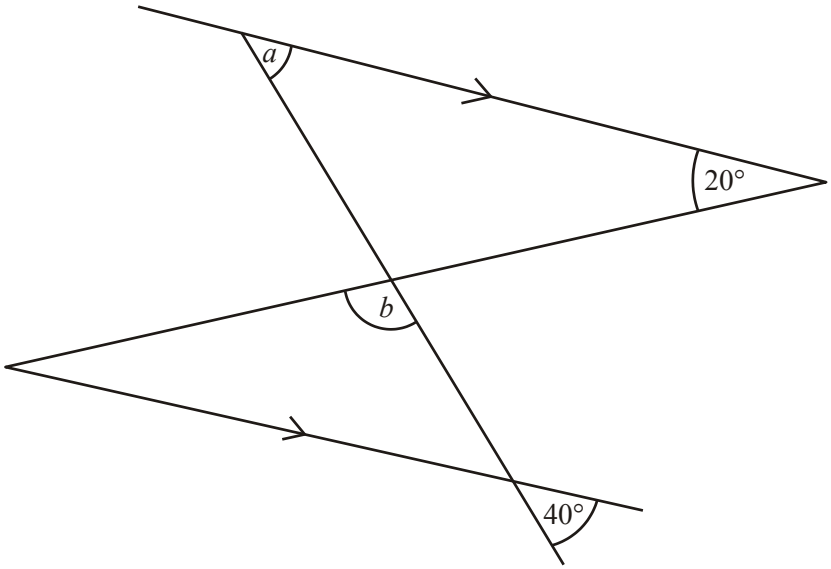
31b How many students were there in total?

.....
(1 mark)

31c What is the mean number of goals scored per student last month?

……
(3 marks)

32. Work out the size of angles *a* and *b.*



Not drawn accurately

Answer *a* = ... degrees, *b* = ……. degrees

.....
(2 marks)

33a Write down the 8th term in this sequence.

4, 10, 16, 22, 28

.....
(1 mark)

33b Write down the formula for the nth term of the following sequence.

-4, 2, 8, 14, 20

……
(2 marks)

33c Which term in the sequence is 62?

.....
(1 mark)

34. 40% of people left the party before it ended. 10% of those who left were men.

The ratio of the number of men who left to those who did not was 2 : 5.

If there were 105 men at the party when it started, how many women were at the party when it started?

……

(4 marks)

35a Simplify $5^4 \times 5^6$

.....

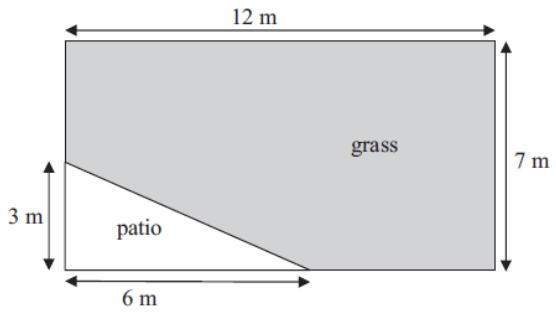
(1 mark)

35b Simplify $7^5 \div 7^2$

.....

(1 mark)

36. Mrs Green's garden is in the shape of a rectangle.
Part of the garden is a patio in the shape of a triangle.
The rest of the garden is grass.



Mrs Green wants to spread fertiliser over all her grass.

One box of fertiliser is enough for 32m² of grass.

How many boxes of fertiliser will she need?
You must show your working.

.....

(4 marks)

37. Andrew paid £12 for 4 cups of coffee and 4 cups of tea.

3 cups of coffee cost as much as 2 cups of tea.

What was the total cost of 5 cups of tea and 5 cups of coffee?

£ .....

(4 marks)

38. Roy gets 10% extra time in school exams.

If Roy gets 1 hour, 33 minutes and 30 seconds to complete his maths exam, how long do most students get?

……minutes

(3 marks)

END