



MERCHANT TAYLORS'  
School

## OFFICIAL PRACTICE PAPER 2

# MATHEMATICS

Time Allowed: 60 minutes

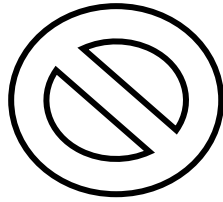
**Instructions:**

**Answer as many questions as possible. Some of them are easy at the start and become more difficult. You should show all your working on this question paper.**

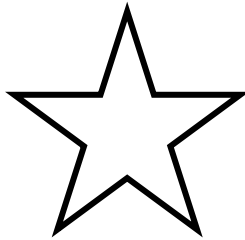
TURN OVER



1. (a) Draw all of the lines of symmetry on the following shape.



- (b) How many lines of symmetry has the shape below?



*Answer:* .....

- (c) Draw a shape with exactly four lines of symmetry in the space below.

*[3 marks]*

2. (a) Write in digits the number seventy three thousand and forty six.

*Answer:.....[1 mark]*

- (b) Write the answer to the sum of two hundred and six plus two thousand three hundred and twenty in words.

*Answer:.....[1 mark]*

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3.

2	5	9	15	24	28	36	45	53
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**From the numbers in the box** above write down:

- (a) A multiple of 7:

*Answer:..... [1 mark]*

- (b) A square number:

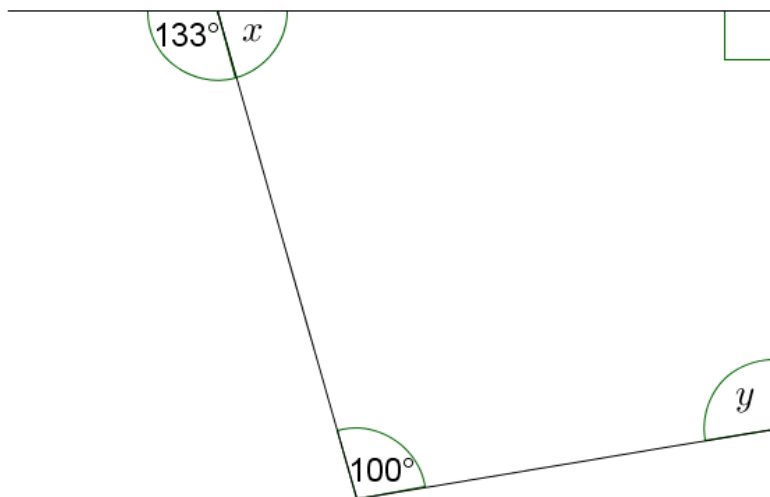
*Answer:..... [1 mark]*

- (c) The product of two of the other numbers in the box:

*Answer:..... [1 mark]*

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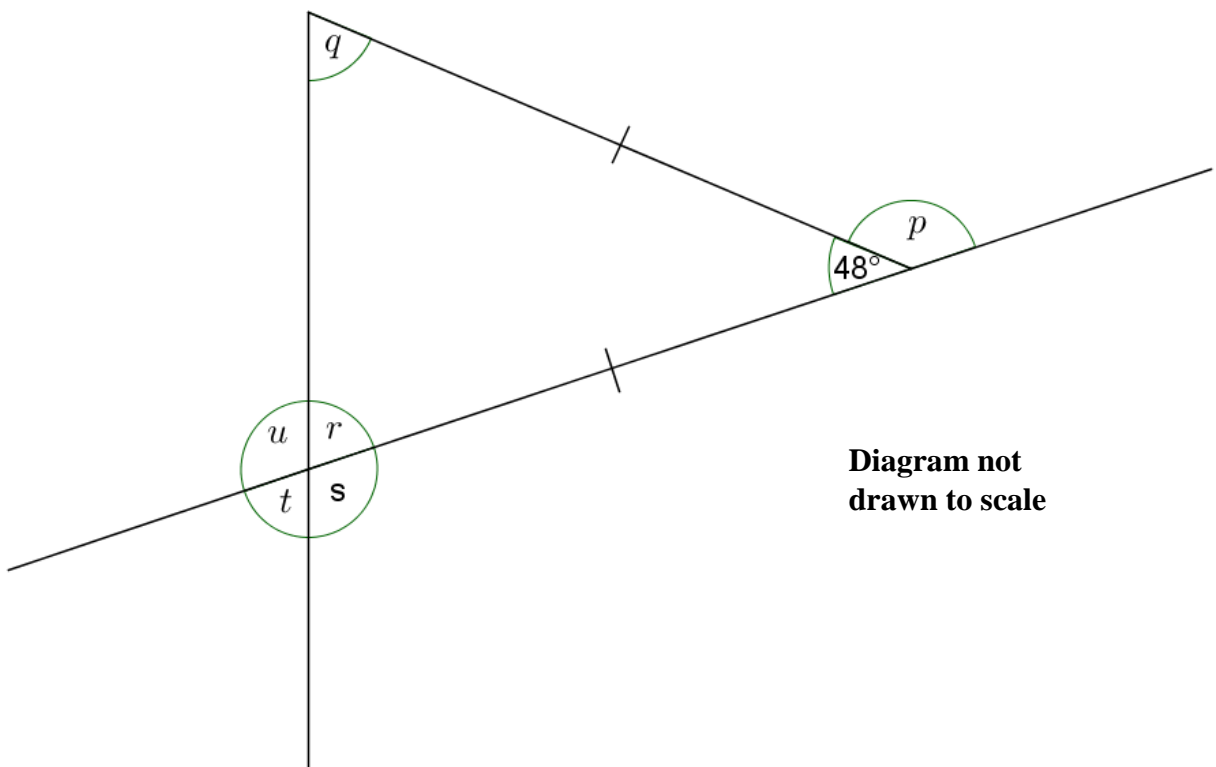
4. (a) Calculate the angles marked  $x$  and  $y$  in the diagram below:



**Diagram not drawn to scale**

*Answer:  $x = \dots\dots\dots$ ,  $y = \dots\dots\dots$  [2 marks]*

- (b) Calculate the angles marked  $p$ ,  $q$ ,  $r$ ,  $s$  and  $t$  in the diagram below:



**Diagram not drawn to scale**

*Answer:  $p = \dots\dots\dots$ ,  $q = \dots\dots\dots$ ,  $r = \dots\dots\dots$ ,  $s = \dots\dots\dots$ ,  $t = \dots\dots\dots$ ,  $u = \dots\dots\dots$  [4 marks]*

5. (a) Sean scored 27 out of 45 in a test. Write this as a percentage.

*Answer:.....% [2 marks]*

- (b) In a class of 30 pupils, 21 are girls. What percentage of the class is boys?

*Answer:.....% [2 marks]*

- (c) Write 0.8 as a fraction in its simplest form.

*Answer:..... [2 marks]*

- (d) Write 85% as a fraction in its lowest terms.

*Answer:.....[2 marks]*

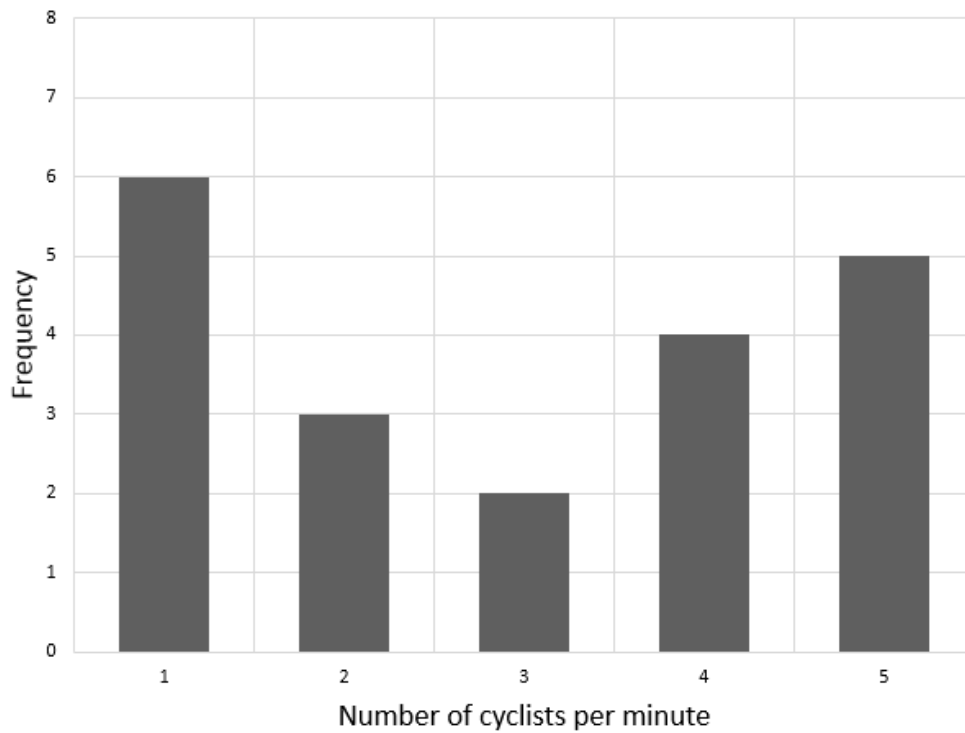
- (e) Rearrange the following in order of size, ***smallest to largest***.

$$\frac{9}{25}, 0.371, \frac{2}{5}, 38\%$$

*Answer:..... [2 marks]*

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6. Sarah sat by the river Thames and recorded the number of cyclists that passed by every minute. She plotted a bar chart of her results.



- (a) What was the largest number of cyclists to pass in one minute?

*Answer..... [1 mark]*

- (b) What was the most frequent number of cyclists per minute?

*Answer.....[1 mark]*

- (c) For how many minutes, in total, was Sarah recording cyclists?

*Answer.....[1 mark]*

Sarah now continues to count the number of cyclists for the next 3 minutes. The number of cyclists were: 1, 4, 1.

- (d) Add this data to the bar chart above.

*[2 mark]*

7. A gardener measures the night time temperatures over two evenings and records the results in the table shown below:

	<b>Monday Temperature in degrees Centigrade</b>	<b>Tuesday Temperature in degrees Centigrade</b>
10pm	3	2
11pm	3	1
12am	2	1
1am	1	0
2am	0	-1
3am	-2	-3
4am	-1	-1
5am	0	0
6am	1	2
7am	2	4

- (a) At what time and on which day was the lowest temperature recorded?

*Answer: .....[1 mark]*

- (b) What was the difference between the lowest and highest temperature on Tuesday?

*Answer: .....°C[1 mark]*

- (c) He realises his thermometer is recording incorrectly and that each temperature should be 5°C lower than was recorded. What is the correct temperature at 1am on Monday?

*Answer: .....°C[1 mark]*

- (d) On Wednesday the forecast is for all temperatures to drop by 3°C from what they were on Tuesday. Bearing in mind his thermometer is broken, what will the actual temperature be on Wednesday at 2am?

*Answer: .....°C[1 mark]*



8. Solve the following equations:

(a)  $3x = 36$

Answer:  $x = \dots\dots\dots$  [1 mark]

(b)  $c + 7 = -15$

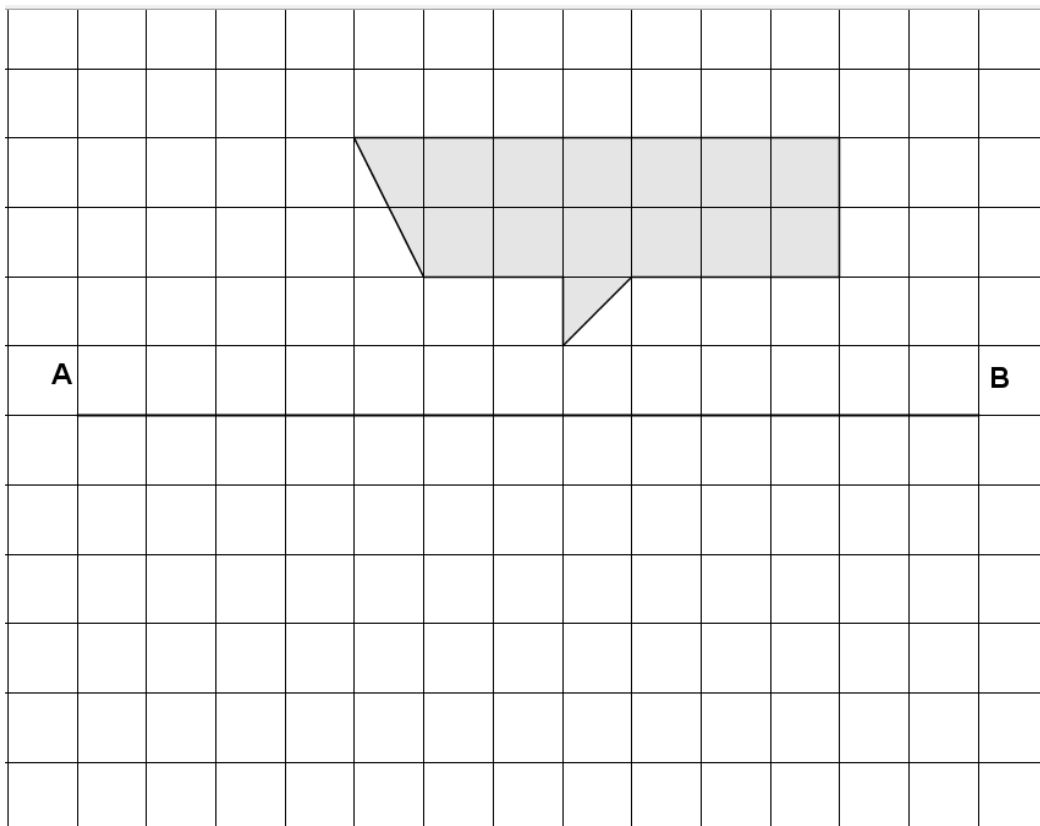
Answer:  $c = \dots\dots\dots$  [1 mark]

(c)  $4p - 2 = 14$

Answer:  $p = \dots\dots\dots$  [1 mark]

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9. On the grid below draw the reflection of the shape shown in the mirror line AB:



[1 mark]

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10. Write the next two terms in each of the following sequences:

(a) 5, 11, 17, 23, ....., .....

[1 mark]

(b) 10, 7, 4, 1, ....., .....

[1 mark]

(c) 2, 8, 32, 128, ....., .....

[1 mark]

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11. The perimeter of a rectangle is 22cm. One of the sides has length 8cm. Calculate the lengths of the other three sides.

*Answer.....cm, .....cm, and .....cm*

[2 marks]

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12. Estimate the following by first rounding each number to the nearest whole number:

(a)  $9.47 \times 34.5$

*Answer:* .....[2 marks]

(b)  $3.75^2 - 11.63 \times 2.87$

*Answer:* .....[2 marks]

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13. (a) Explain why 91 is not a prime number.

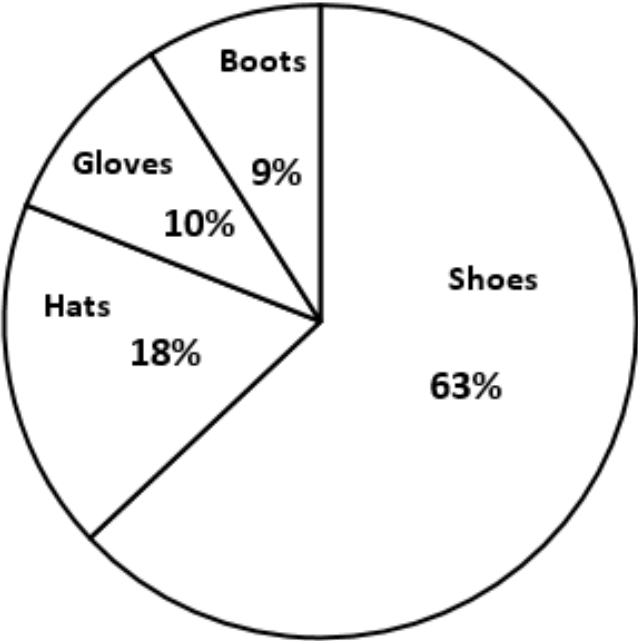
*Answer:* .....  
.....[1 mark]

(b) What is the 7<sup>th</sup> prime number?

*Answer:* .....[1 mark]

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14. The contents of part of a wardrobe are shown in the pie chart below:



What fraction, in its simplest form, of **Footwear** are boots?

*Answer: .....[ 2 marks]*

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- 15.** (a) Find the highest common factor (HCF) of 66 and 30.

*Answer: .....[1 mark]*

- (b) Find the lowest common multiple (LCM) of 12 and 8.

*Answer: .....[1 mark]*

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- 16.** Fazal has £2.60 and Gareth has £5.30. Gareth gives Fazal some 5p coins. Each boy now has the same amount of money. How many 5p coins did Gareth give Fazal?

*Answer: ..... [2 marks]*

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17. Circle the most appropriate unit of measure for the following:

(i) The length of an airplane

*Answer: millimetres kilometres centimetres metres [1 mark]*

(ii) The weight of a cat

*Answer: ounces tons pounds stones [1 mark]*

(iii) The capacity of a bath

*Answer: pints gallons fluid ounces millilitres [1 mark]*

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18. A box of celebrations contains one Twix, one Snickers, one Milky Way, and ten Bounty chocolates. Jane chooses a chocolate at random. Put a ring around the correct answer in the list to show the probability that the chocolate will be:

(a) A Bounty

*Answer: impossible unlikely even chance likely certain [1 mark]*

(b) A Twix

*Answer: impossible unlikely even chance likely certain [1 mark]*

(c) A Galaxy

*Answer: impossible unlikely even chance likely certain [1 mark]*

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19. (a) Which is the greater?

$$3 \times 2^3 \quad \text{or} \quad 2 \times 3^2$$

Answer: .....[1 marks]

(b) By how much?

Answer: .....[1 marks]

(c) Write down **two** cube numbers which are also square numbers.

Answer: ..... and .....[2 marks]

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20. If:  $\frac{3}{x} \times \frac{4}{7} = \frac{3}{14}$

Calculate the value of  $x$ .

Answer: .....[2 marks]

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21. There are  $x$  horses,  $y$  cows and one three legged dog in a field.
- (a) Write down an expression in algebra for the total number of legs in the field.

*Answer:.....[2 marks]*

Half of the cows and one quarter of the horses leave the field.

- (b) Write down an expression in algebra for the number of heads that remain in the field.

*Answer:.....[2 marks]*

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22. An alloy contains iron and tungsten in the ratio 5 parts to 1 part.

- (a) If the mass of the alloy is 72kg, how much iron and tungsten does it contain?

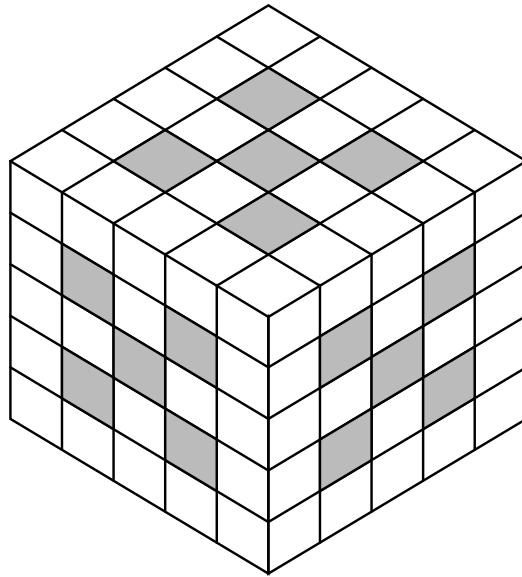
*Answer: Iron:.....kg, Tungsten:.....kg [2 marks]*

- (b) If there is 15kg of iron in a quantity of the alloy, how much tungsten is there?

*Answer:.....kg[1 mark]*

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23. A large cube is made by gluing together smaller white and grey cubes of volume  $1\text{cm}^3$  as shown. If five grey cubes are removed from each face of the larger cube, what is the total volume remaining?



**Diagram not drawn to scale**

*Answer: ... ..  $\text{cm}^3$  [1 mark]*

24. If a basketball weighs 300g plus half its own weight, how much does it weigh?

*Answer: .....g [1 mark]*

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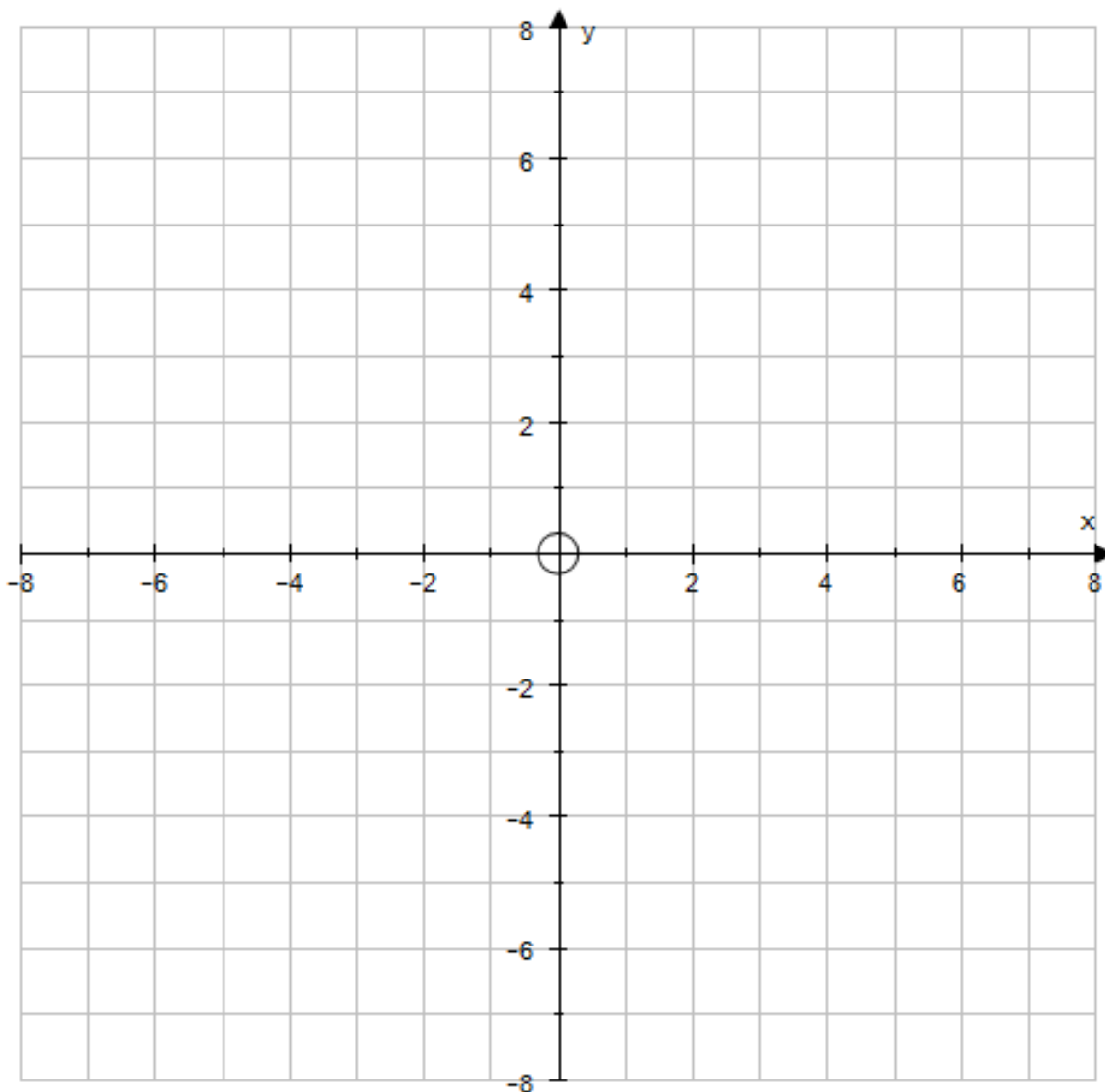
25. 25 students have taken an exam and the mean number of marks is recorded as 83.  
The examiner subsequently awards 5 additional marks to 9 of the students and takes away 2 marks from 10 other students.  
What will the new mean mark be?

*Answer: .....[2 marks]*

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26. The centre of a square is at the point (1, 2) and one of the vertices (corners) of the square is at the point (4, 7).

(a) Plot the centre of the square and one of the vertices on the grid below.



[2 marks]

(b) Plot the other three vertices of the square on the grid above, and write down the co-ordinates of the three points you have just plotted.

Answer: ( ..... , ..... ), ( ..... , ..... ), ( ..... , ..... ) [3 marks]

27. The number of leaf cutter ants doubles every day for the first week.

- (a) If there were 10 at the end of the first day how many are there at the end of the second day?

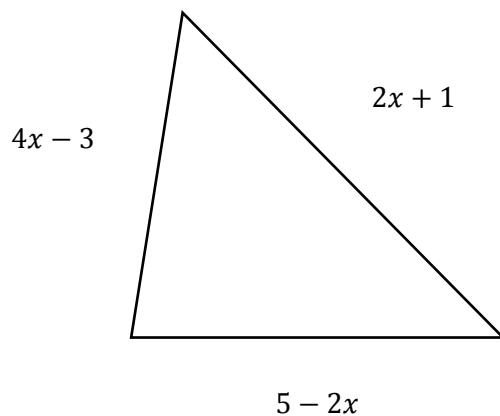
Answer.....[1 mark]

- (b) How many were there at the end of the week?

Answer.....[1 mark]

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28. Find in terms of  $x$  the perimeter of the following triangle:



Answer:.....[2 marks]

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29. (a) An egg box holds 6 eggs. How many boxes are needed for 100 eggs?

*Answer.....[1 mark]*

(b) A toy train travels 6 metres in two seconds. How far will it travel in one minute?

*Answer.....m[1 mark]*

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30. One of the angles of an isosceles triangle is  $96^\circ$ . Find the sizes of the other two angles.

*Answer:..... $^\circ$  and ..... $^\circ$  [2 marks]*

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31. Mrs Jones is 24 years older than her daughter. The sum of their ages is 70 years. How old is Mrs Jones?

*Answer: ..... years [2 mark]*

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32. A metal rod is  $10\frac{4}{5}$  metres long. How many short rods  $\frac{3}{10}$  metres long can be cut from the longer rod?

**Show full working.**

*Answer: ... .. [2 marks]*

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33. Two different clocks show the time 3 o'clock. The first gains 5 minutes per hour and the second gains 20 minutes per hour. How long will it be in hours before both clocks look as though they show the same time?



Gains 5 minutes per hour



Gains 20 minutes per hour

*Answer: .....hours[2 marks]*

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34. A “double-decker” sandwich has three slices of bread and two layers of filling. (e.g. bread/filling/bread/filling/bread). Each slice of bread has to be buttered on each side that is in contact with the filling. I make as many of these sandwiches as possible from a sliced loaf which has 22 usable slices, excluding crusts which are not used. How many sides of bread do I have to butter?

*Answer:.....sides [2 marks]*

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35. The two-digit by two-digit multiplication below has lots of gaps, but most of them can be filled by logic (not by guesswork). Which digit must go in the position of the \* ?

$$\begin{array}{r}
 \phantom{0}4 \square \\
 \times \phantom{0}\square\square \\
 \hline
 \phantom{0}\square 8 \square \\
 \phantom{0}8 \square 0 \\
 \hline
 \square \square 4 * \\
 \hline
 \end{array}$$

Answer: ..... [2 marks]

**END OF EXAMINATION  
NOW CHECK YOUR WORKING**