



MERCHANT TAYLORS'  
School

# MERCHANT TAYLORS' SCHOOL

**11+ OFFICIAL PRACTICE PAPER**

## MATHEMATICS

**Time Allowed: 60 minutes**

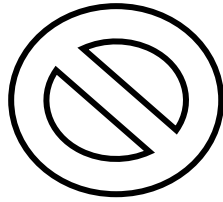
**Instructions:**

**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.**

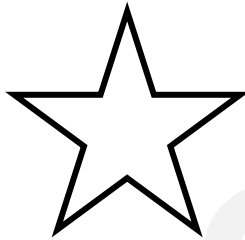
**TURN OVER**



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:

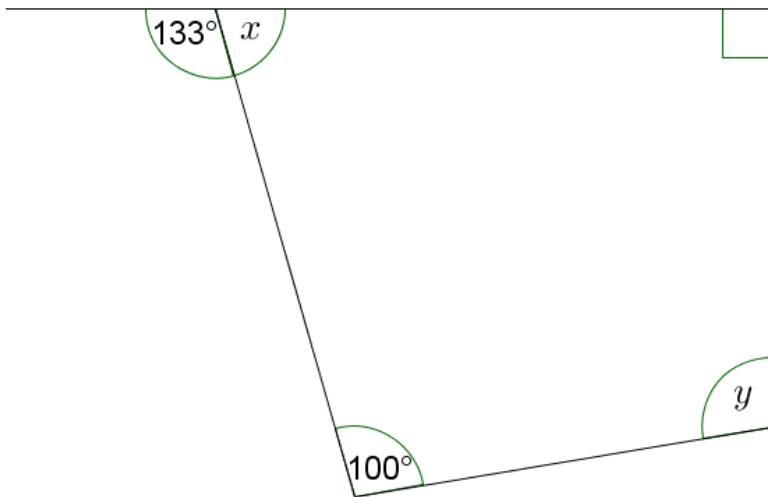
*Answer:..... [1 mark]*

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

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

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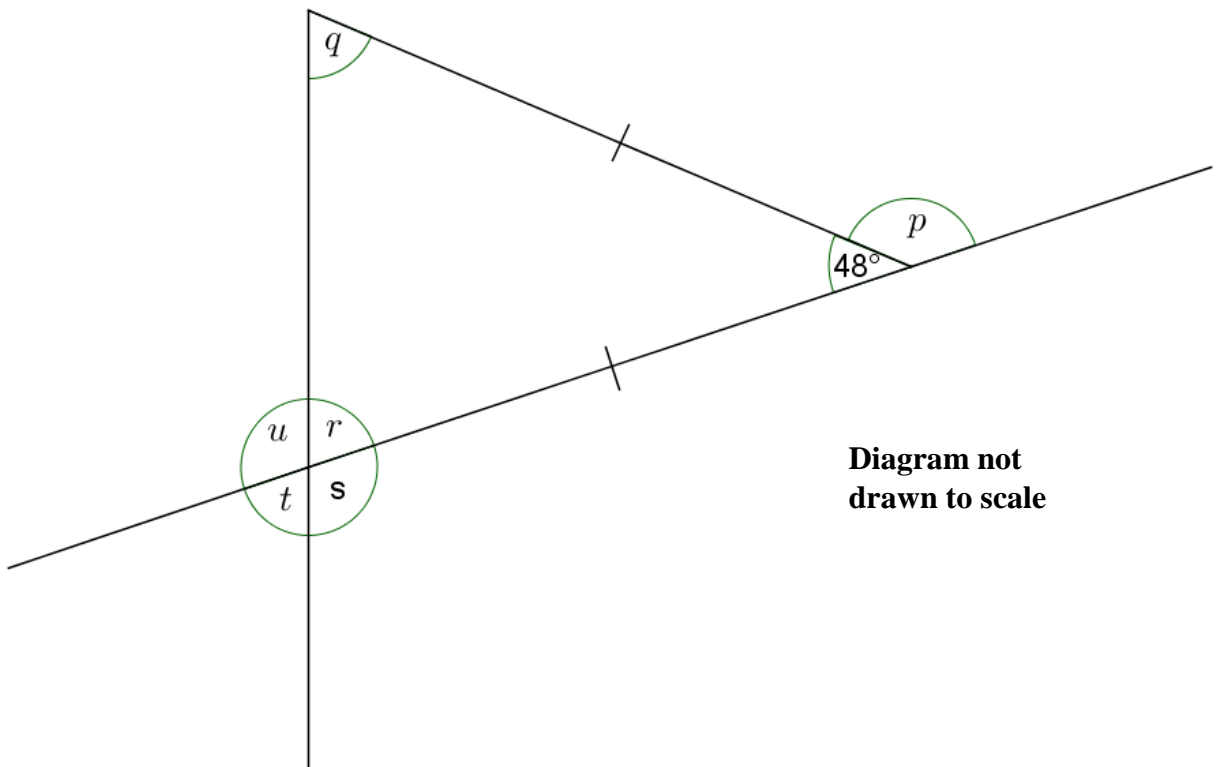
4. (a) Calculate the angles marked  $x$  and  $y$  in the diagram below:



**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]

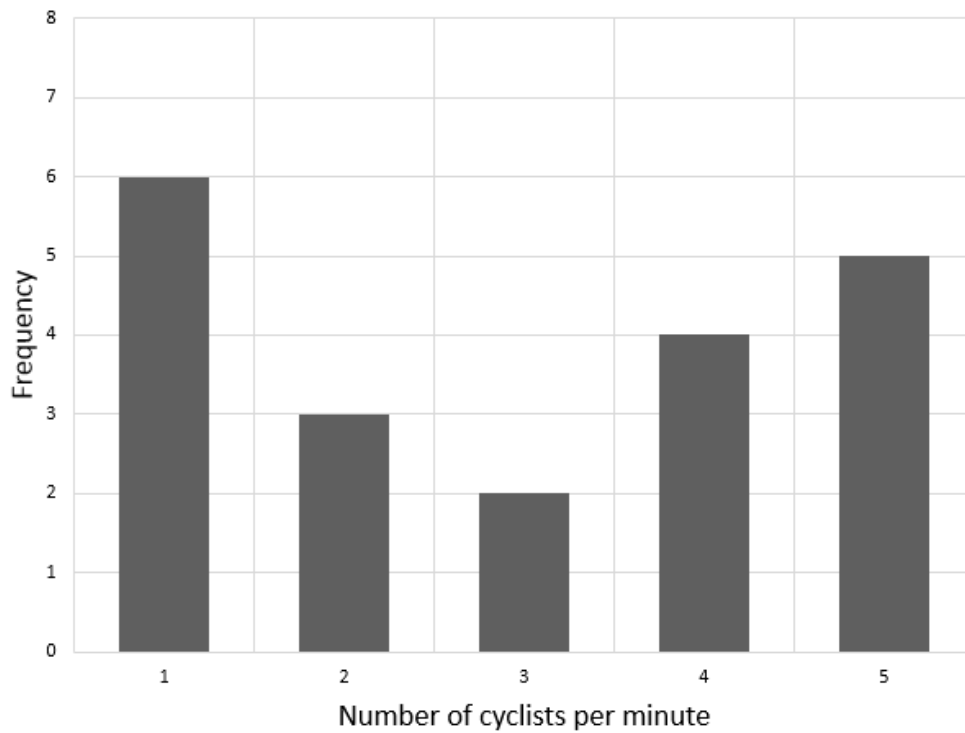
- (e) Rearrange the following in order of size, **smallest to largest**.

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

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)  $c + 7 = -15$

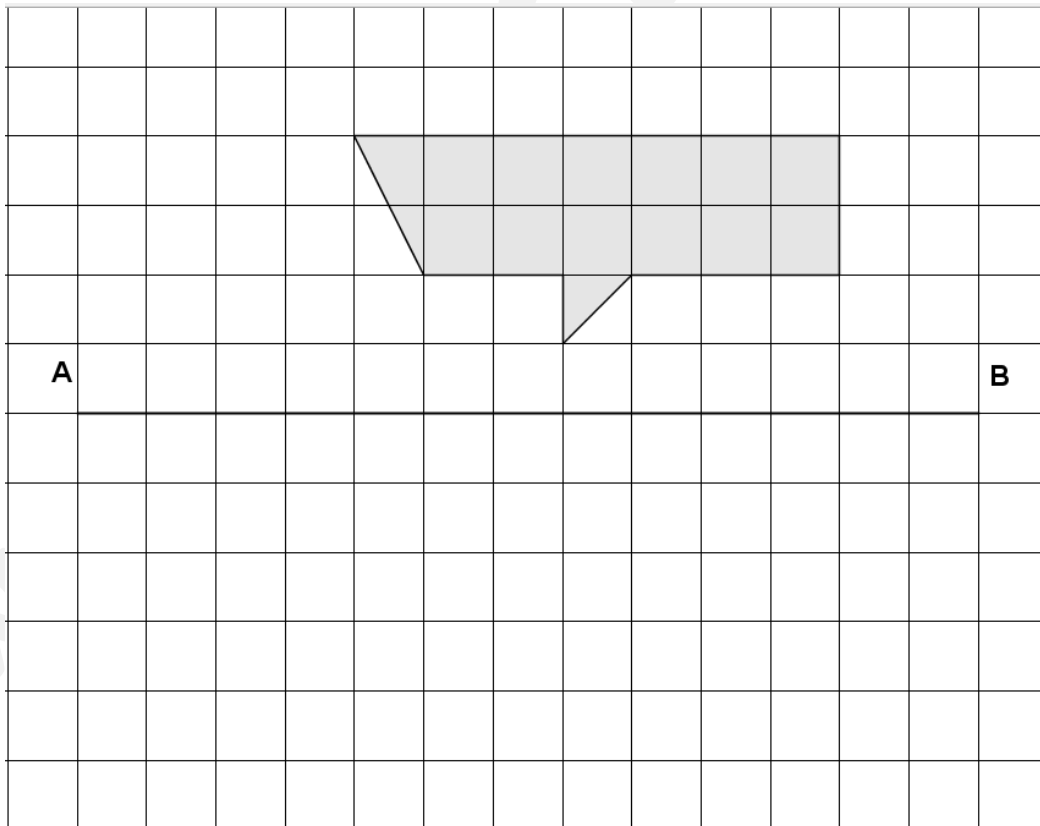
Answer:  $c = \dots\dots\dots$  [1 mark]

(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.

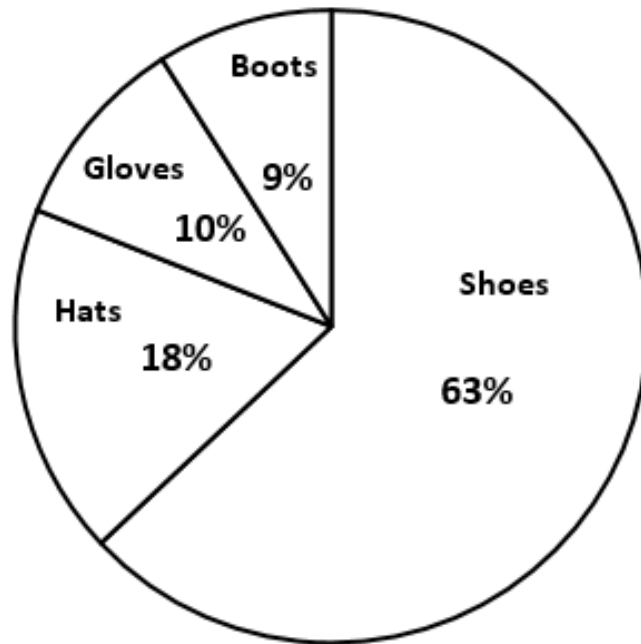
Answer: .....  
.....[1 mark]

(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?

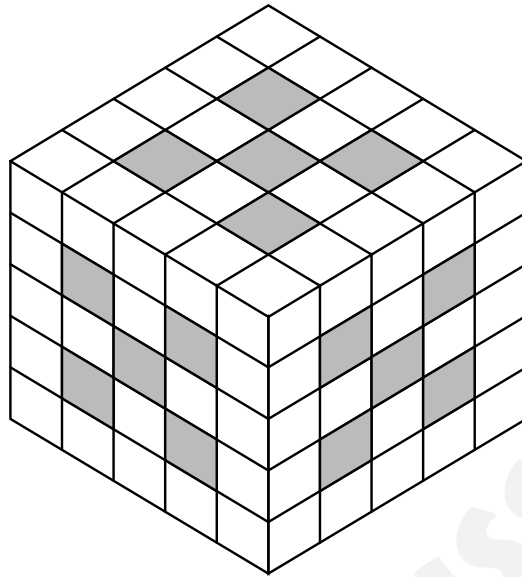


Diagram not drawn to scale

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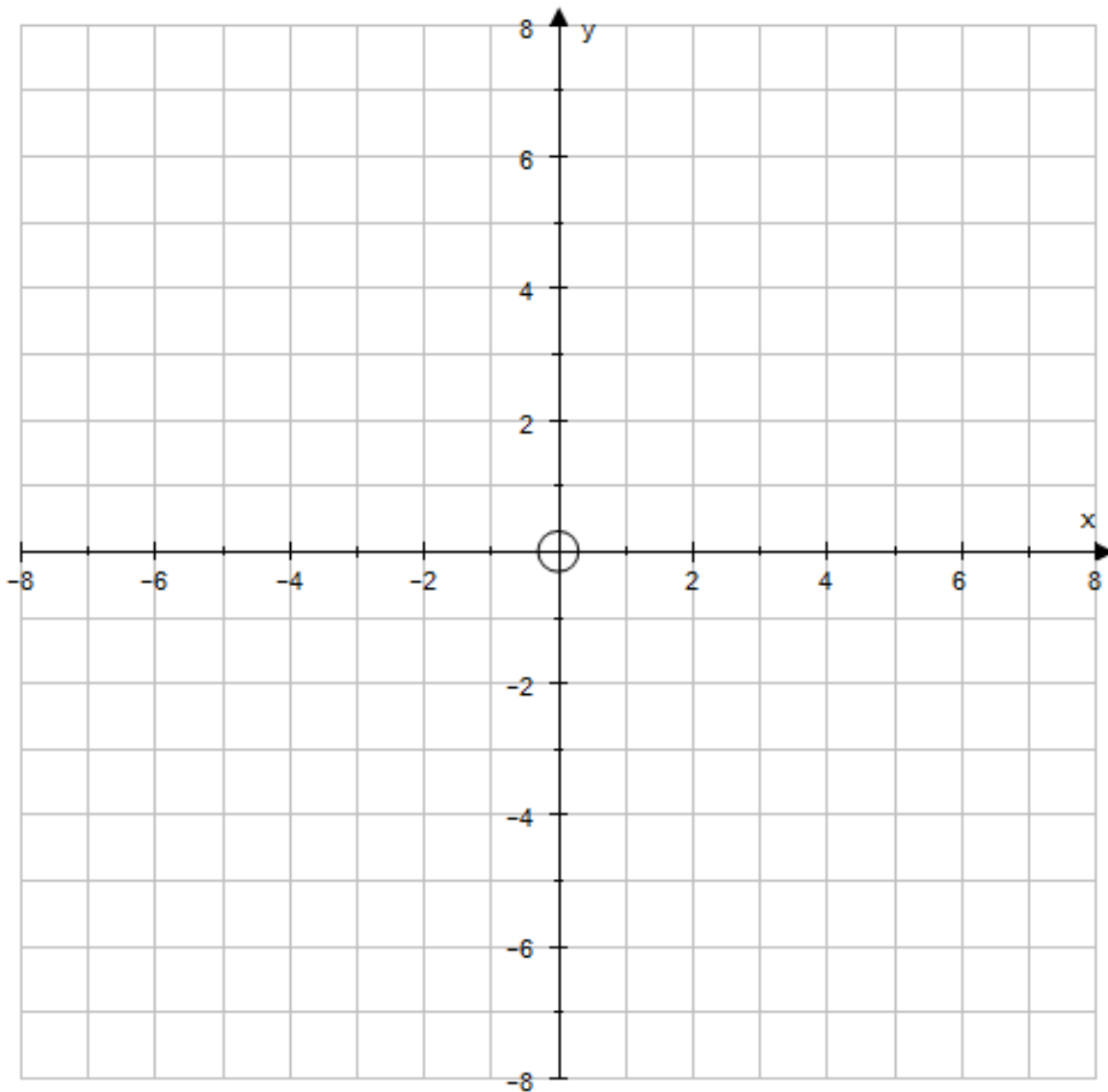
25. 25 students have taken an exam and the mean number of marks is recorded as 83.  
The examiner subsequently awards 5 additional marks to 9 of the students and takes away 2 marks from 10 other students.  
What will the new mean mark be?

*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?

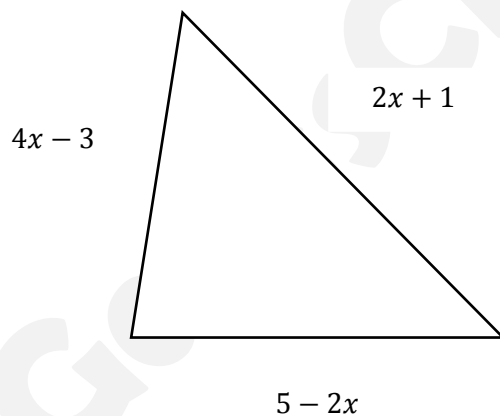
Answer.....[1 mark]

- (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 \* ?

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

Answer: ..... [2 marks]

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**END OF EXAMINATION  
NOW CHECK YOUR WORKING**