MERCHANT TAYLORS' SCHOOL

11+ OFFICIAL PRACTICE PAPER

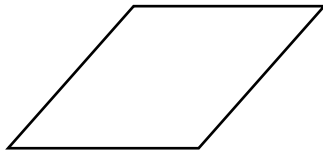# MATHEMATICS

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.
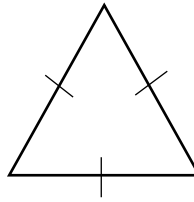
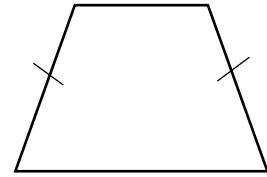**1.**   Write down the names of the following shapes:

(a)   (b)   (c)

…………………….   ………………...…   …………………………

[3 marks]

2.   Put the following in order of size, **with the smallest first**.

$$0.43, \quad \frac{3}{7}, \quad \frac{2}{5}, \quad 44\%$$

Answer: ……………………………………………………………………… *[2 marks]*

3.   Write the next term in the following sequences:

(a)   7,   9,   11,   13,   15,   ……….

(b)   −1,   -5,   -9,   -13,   ……….

(c)   1,   8,   27,   64,   ……….

[3 marks]

4. Arrange the digits 7, 6, 5, and 4 so that the resulting number is closest to five thousand.

Answer: ………………………………… [2 marks]

5. State whether the following statements are:

Certain   Likely   Evens   Unlikely   Impossible

(a) You will get a head when you flip a coin.

Answer: ………………………………… [1 mark]

(b) Tomorrow, I will find a £10 note on the floor.

Answer: ………………………………… [1 mark]

(c) The sun will rise tomorrow morning.

Answer: ………………………………… [1 mark]

6.   Here are four statements.

A triangle can have 2 acute angles. ☐

A triangle can have 2 obtuse angles. ☐

A triangle can have 2 parallel sides. ☐

A triangle can have 2 perpendicular sides. ☐

For each statement put a tick (✔) in the box next to it if it is **possible**.

Put a cross (✖) in the box if it is **impossible**.

[2 marks]

_____

7.   Four lamp posts are in a straight line. The distance from each post to the next is 25m.

What is the distance from the first post to the last?

Answer: ……………………..m [1 mark]

_____

Turn Over!

8. (a) Write down all the factors of 36.

Answer: …………………………………………………………… *[2 marks]*

(b) What is the highest common factor of 36 and 18?
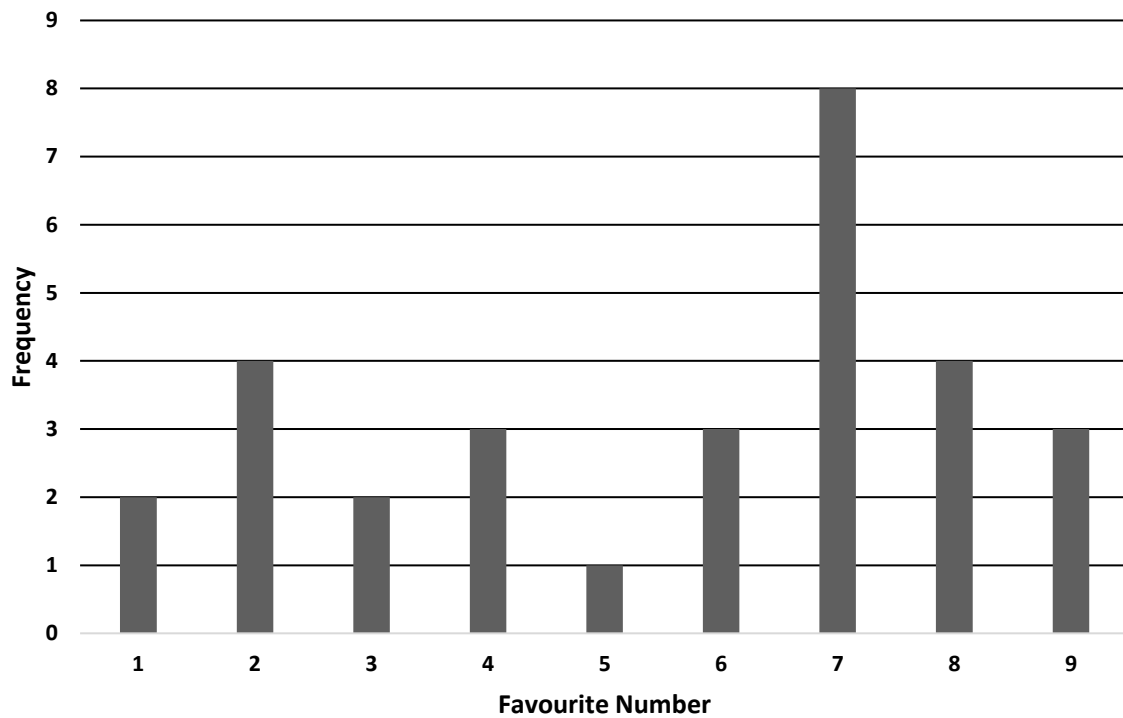
Answer: …………………………… *[1 mark]*

(c) What is the lowest common multiple of 12 and 15?

Answer: …………………………… *[2 marks]*

(d) Write down all the prime numbers between 50 and 60.

Answer: …………………………………………………………… *[2 marks]*

9. A class of pupils were surveyed to find out their favourite number. The results are shown in the bar chart below:

(a) Which number was chosen most frequently?

Answer: ……………………… [1 mark]

(b) How many pupils were in the class?

Answer: ……………………… [1 mark]

Turn Over!

10. (a) According to Google, the area of London is 1572km^2.

Round this number:

(i) Correct to the nearest 10 km^2.

Answer: …………………………..km^2 [1 mark]

(ii) Correct to the nearest 100 km^2.

Answer: …………………………..km^2 [1 mark]

(b) Carpenter ants can measure up to 2.64cm long

Round this number:

(i) Correct to 1 decimal place.

Answer: …………………………cm [1 mark]

(ii) Correct to the nearest cm.

Answer: …………………………cm [1 mark]

11. The table shows information about some goal scorers across 3 football leagues:

Name	League	Goals	Matches
Iago Aspas	Spanish	19	32
Timo Werner	German	21	31
Romelu Lukaku	English	25	37
Dele Alli	English	18	37
Anthony Modeste	German	25	34
Cristiano Ronaldo	Spanish	26	29

From the players listed here,

(a)   which player scored the most goals?

Answer: ………………………………… [1 mark]

(b)   which league did the player who scored the least goals play in?
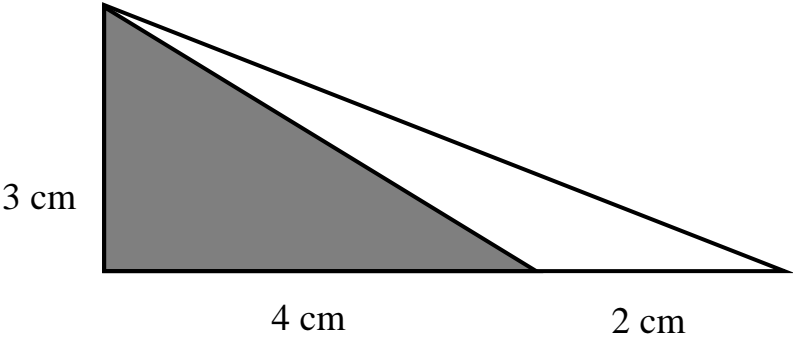
Answer: ………………………………… [1 mark]

(c)   which league had the most goals scored in it by these players?

Answer: ………………………………… [1 mark]

12.   Ali has six times as much chocolate as Beth. Carl has twice as much chocolate as Beth. If Carl has 200g of chocolate, how much chocolate does Ali have?

Answer: …………………………………g [2 marks]

Turn Over!

13. A right-angled triangle has the dimensions as shown. What is the area of the **unshaded** region?

3 cm

4 cm   2 cm

Answer: …….………………………….cm² [2 marks]

14. Find 5% of 24.

Answer: …….…………………………. [2 marks]

15. (a) What temperature is 12 degrees colder than $-4°C$?

Answer: …………………………°C [1 mark]

(b) Raj is overdrawn at the bank by £40. His sister Sarina is richer than him by £70. How much money does Sarina have?

Answer: £………………………… [1 mark]

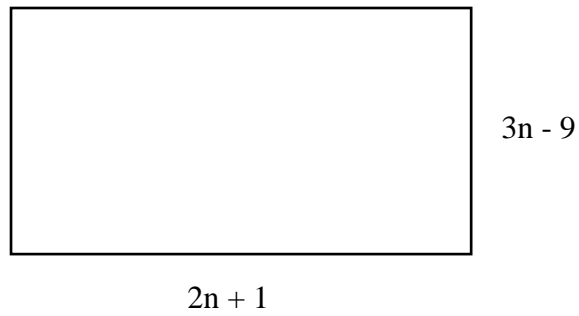**16.** Simplify the following algebraic expressions:

(a) $4p + 3q + 2p + 7q$

Answer: …………………………… [2 marks]

(b) $2a + 10b - a - 14b$

Answer: …………………………… [2 marks]

Turn Over!

17. The diagram shows a rectangle.

$$3n - 9$$

$$2n + 1$$
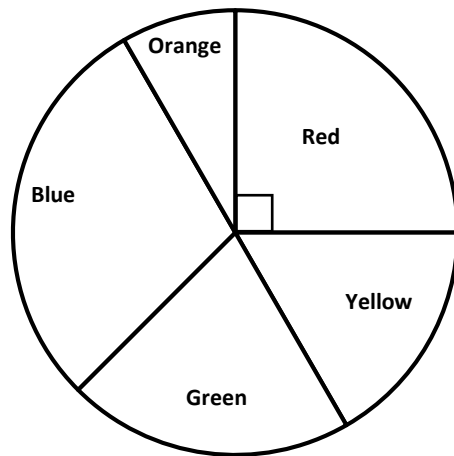
The length of the rectangle is 2n + 1.

The width of the rectangle is 3n – 9.

Write down an expression for the perimeter of the rectangle. **Fully simplify your answer**.

Answer: ……………………………………………… [2 marks]

18. Year 8 were asked to choose their favourite colour. The pie chart below shows the results of this survey.

If 30 pupils chose red:

(a)   How many pupils are there in year 8?

Answer: ……………………………… [1 mark]

(b)   How many pupils chose green or blue?

Answer: ……………………………… [1 mark]

19. Jeff goes to the cinema. He buys a ticket for £5.75, popcorn for £1.50 and a drink for 76p. His return train fare is £3.80. If he leaves home with a £20 note how much change does he return with?

Answer: £……………………………… [3 marks]

Turn Over!

20. Solve the following equations:

(a) $$2x - 3 = 11$$

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

(b) $$\frac{2}{3}x - 2 = 4$$

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

(c) $$3(x - 2) - 2(x - 3) = 4$$

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

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21. Write down two **different** odd prime numbers that add together to make a square number.

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

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22. Anna has 3 brothers and 5 sisters. Her brother Tom has S sisters and B brothers.
What is the value of $S \times B$?

Answer: ……………………………… [2 marks]

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23. What is the remainder when:

$$743589 \times 301647 \text{ is divided by } 5 ?$$

Answer: ……………………………… [2 marks]

Turn Over!

24. Which fraction is half way between $\dfrac{3}{7}$ and $\dfrac{4}{7}$?

Give your answer in its simplest form.

Answer: ………………………………… [2 marks]

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25. **£50 000** in £50 notes weighs about 1.3Kg. How much, **in grams,** does one £50 note weigh?

Answer: …………………g [1 mark]

26.

Diagram **NOT** accurately drawn
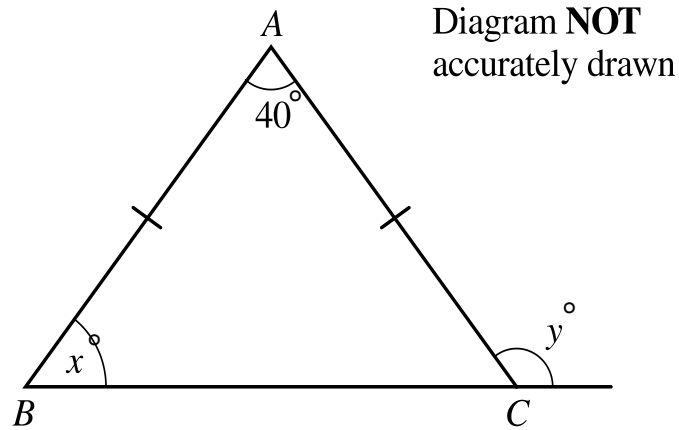
$AB = AC$

(a)   Write down the name that is given to this type of triangle.

Answer:…………………………………………………… [1 mark]

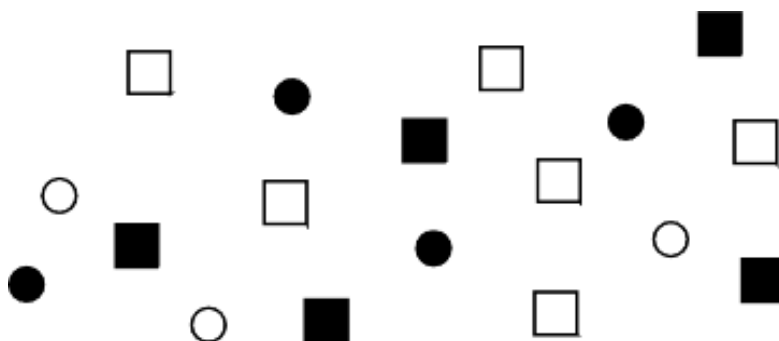(b)   Showing your working, calculate the size of the angle:

(i) $x°$

Answer: $x =$……………° [2 marks]

(ii) $y°$

Answer: $y =$……………° [2 marks]

Turn Over!

27. The diagram shows 18 shapes.

(a) Complete the table to show the number of shapes in each category.

	White	Black
Circle		
Square		

[2 marks]

One of the shapes in the diagram is chosen at random.

(b) Write down the probability that the shape will be;

(i) a black square.
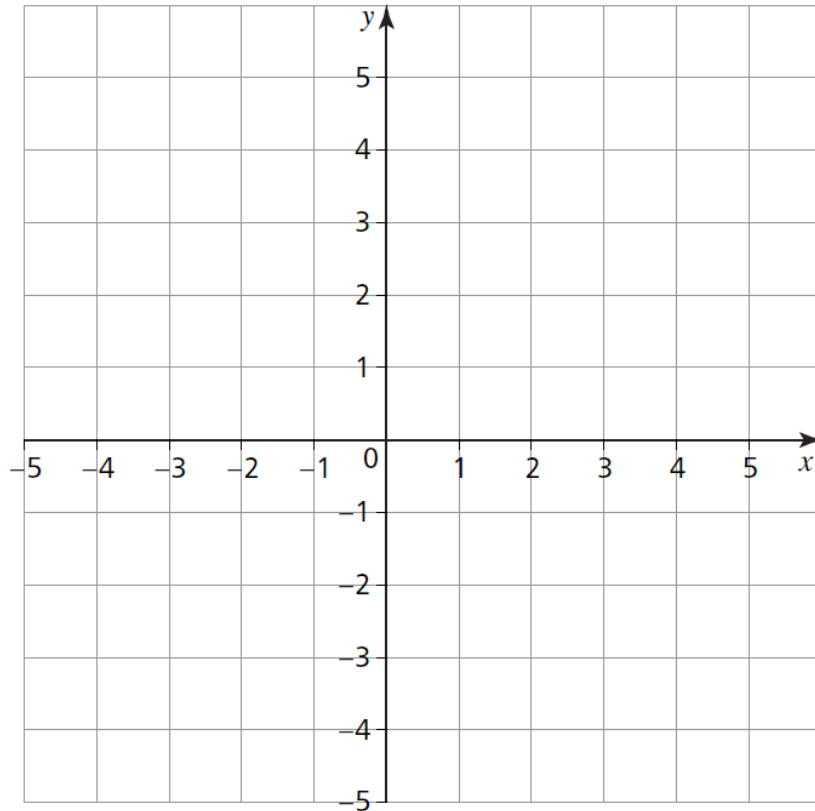
Answer: ……………… [2 marks]

(ii) a white square or a black circle.

Answer: ……………… [2 marks]

28.

(a) On the grid above plot and label the coordinates **P** (1, 4),**Q** (4, 2),and **R** (1, -4).

[2 marks]

(b) The points form three vertices of a kite *PQRS*. Plot the point **S** and draw the kite.

[1 mark]

(c) Write down the coordinates of the point **S**.

Answer: (……, ……)[1 mark]

Turn Over!

29. To make porridge, Goldilocks mixes 3 bags of oats with 1 bag containing 20% wheat bran and 80% oats. All the bags have the same volume. What percentage of the porridge mix is wheat bran?

Answer: …………………………% [3 marks]

30. When a glass is full of water the total mass is 400g. When the glass is half full of water the total mass is 320g. Find the mass of the glass.

Answer: …………………………g [1 mark]

31. (a) The mean age of the five members of the 'Macaroon 5' boy band is 18.

A new member joins the band. His age is 24. What is the new mean age of the group?

Answer: …………………….yrs [2 marks]

(b) Find 4 numbers which have a mean of 7, a median of 8 and a mode of 9.
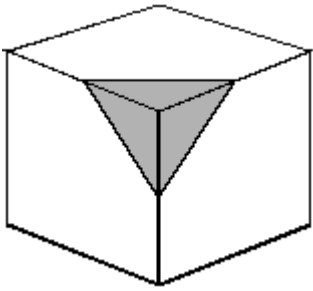
Answer: ………,………,………,……… [3 marks]

(c) The mean weight of 5 children is 45kg.

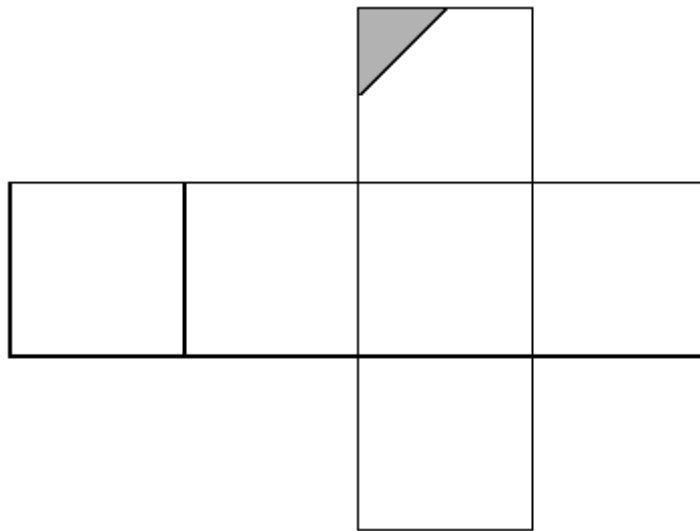The mean weight of the lightest three children is 42kg and the mean weight of the heaviest three children is 49kg.

What is the median weight of the children in kg?

Answer: ……………………..kg [3 marks]

Turn Over!

32. A cube has shaded triangles on three of its faces.

Here is the net of the cube.
Draw in the two missing shaded triangles.

[2 marks]

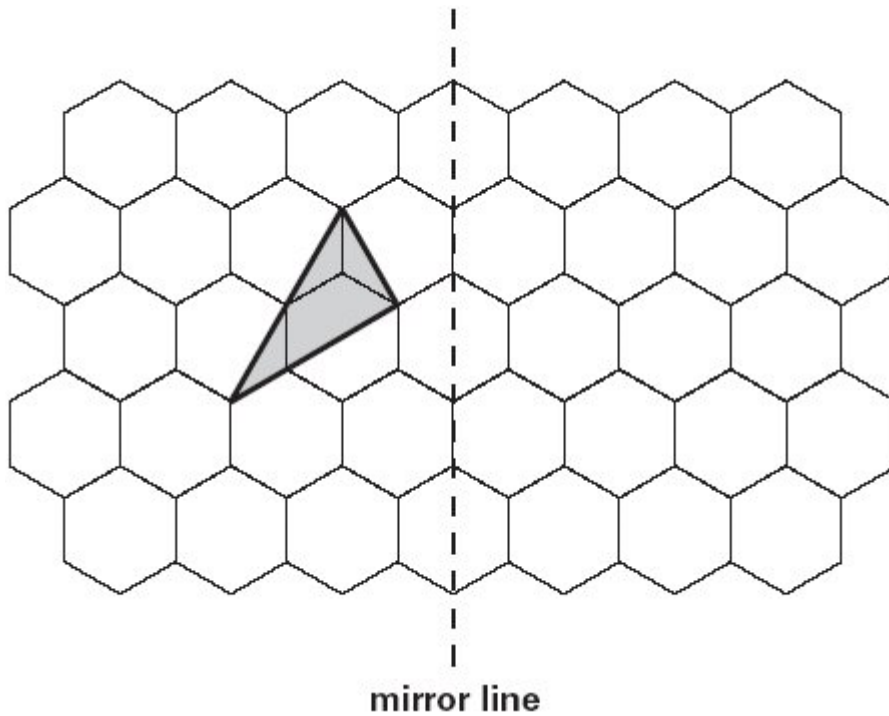**33.** This grid is made of hexagons.

Draw the reflection of the shaded shape on the grid.

mirror line

[1 mark]

34. A rectangle has a length of 50mm and has the same area as a square with side 70mm.

Calculate the perimeter of the rectangle.

Answer: ………………… mm [3 marks]

Turn Over!

35.   A bag contains 49 red balls and 1 blue ball. How many red balls should be removed for the bag to contain 90% red balls?

Answer: ………………………………… [2 marks]

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36.   A ball is dropped and bounces up to a height that is 75% of the height from which it was dropped. It then bounces again to a height that is 75% of the previous height and so on. How many bounces does it make before it bounces to a height that is less than 25% of the original height?

Answer: ………………………………… [2 marks]

END OF EXAMINATION
NOW CHECK YOUR WORKING