'Must Know' GCSE Foundation Revision Booklet!

Name_____

Class_____

Target Grade_____

Foundation Algebra   www.m4ths.com

(1) Simplify the following:

$2x + y + x + 3y$ _____ $3p - 5q - 4p + 7q$ _____ $-4t + 5u + u - t + 5$ _____

(2) Multiply out (expand) the following:

$2(x + 4)$ _____ $3(2x - 3)$ _____ $x(x + 4)$ _____ $2x(5 - 3x)$ _____

(3) Factorise the following:

$2x + 4$ _____ $4x + 6$ _____ $10x + 15xy$ _____ $6x^2 + 12x$ _____

(4) Write an expression for the following:

'Three more than x' _____   '2 times x' _____   'Half of x' _____   'x times x' _____

(5) Write next to each question below if they are an expression, an equation, an inequality or a formula:

$x < 4$ _____ $2x - 1 = 5$ _____ $P = 5Q + 2$ _____ $x^3 = 8$ _____ $2x + y$ _____

(6) Solve the following equations:
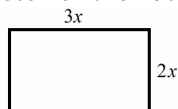
$2x - 1 = 5$ _____ $2 - 3x = 5$ _____ $5(3x - 2) = 10$ _____

(7) Solve the following equations:

$2x + 4 = x + 10$ _____ $5x - 4 = 3x + 2$ _____ $6x - 2 = 10 - x$ _____

(8) Fred is n years old. Sue is five years older than Fred. Tom is 3 times Fred's age. Write an expression for Sue's age and Tom's age in terms of n.

_____

(9) Find an expression for the area **and** the perimeter of the rectangle below.

_____

(10) Given that the perimeter of the rectangle in question (9) is 30cm, find the value of x.

(11) Frank has n coins. Peter has 3 less coins than Frank. Kevin has 4 times as many coins as Frank. Between them the 3 men have 45 coins. **Set up and solve an equation** to find how many coins each of the men has.

_____

(12) Find the value of each of the following when $p = 2$ and $q = -1$:

$3p + q$ _____ $p^2 - q$ _____ $(p + 2q)^2$ _____ p^3 _____

(13) List 3 integers that satisfy each inequality below:

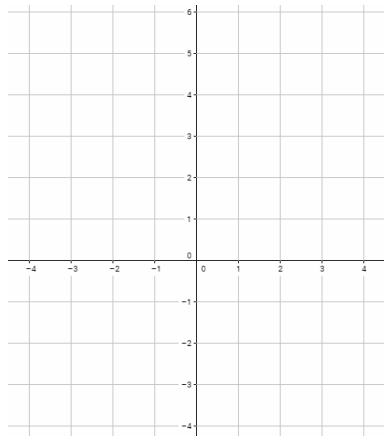$x > 4$ _____ $x \leq 7$ _____ $x \geq -2$ _____ $2 < x \leq 6$ _____

(14) Use trial and improvement to solve $x^2 + 2x = 43$. Give your answer to one decimal place. The solution lies between 5 and 6.

x	Value	Comment

(15) Complete the table of values and plot the following graphs:

$$y = 2x + 1$$

x	-2	-1	0	1	2	3
y						

$$y = x - 2$$

x	-2	-1	0	1	2	3
y						
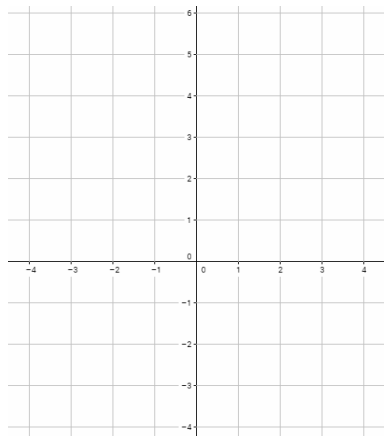
(16) Complete the table of values and plot the graph of $y = x^2 - 2x - 1$:

x	-2	-1	0	1	2	3
y						
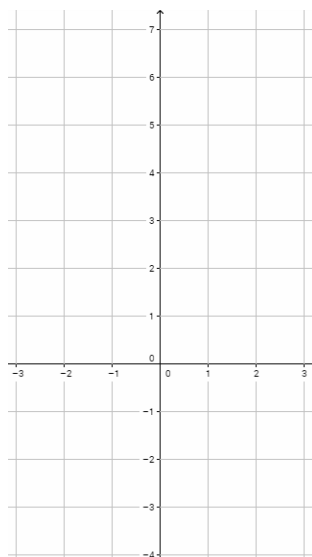
(1) Find the area **and** the perimeter of the shapes below:

6cm

9cm

3cm

2cm

7cm

4cm

2cm

13.5m   10m

9m
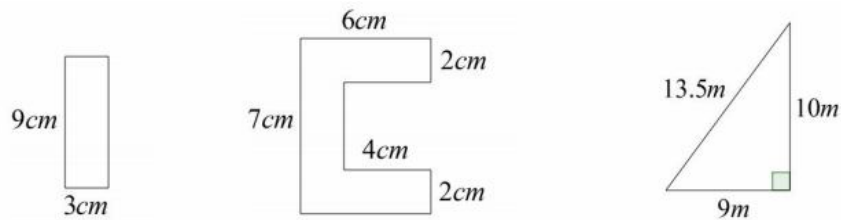
(2) Find the area of the shapes below:

5km

8km

6cm

6km

7km

8km

5m   6m
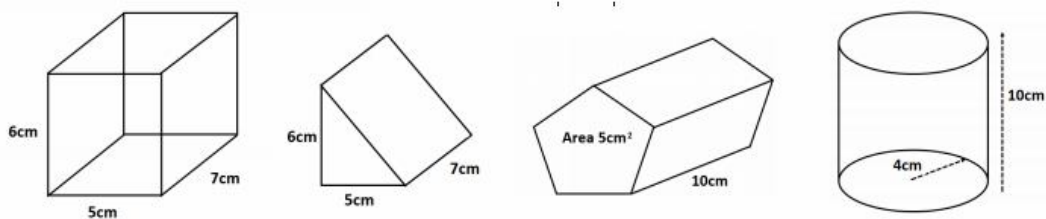
6

8

1

1
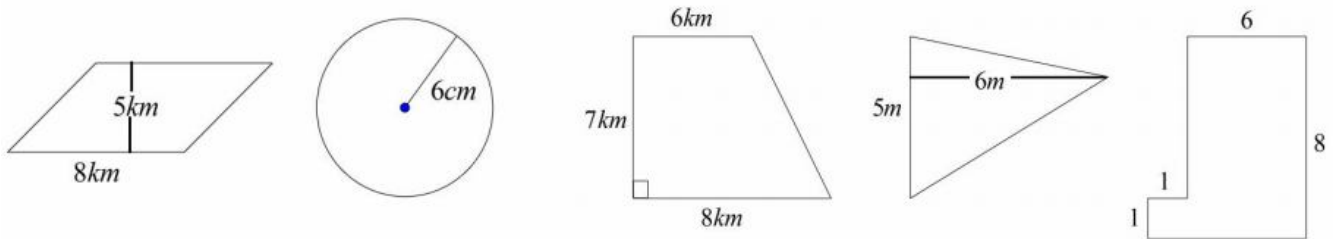
(3) Find the area and the circumference of a circle with a radius of 5mm.

(4) Name each shape below and find the volume of each:

6cm

5cm

7cm

6cm

5cm

7cm

Area 5cm²

10cm

10cm

4cm

(5) (a) Find the surface area of the cuboid in Question (4). (It's a closed top box). (b) Sketch a net of the cuboid.
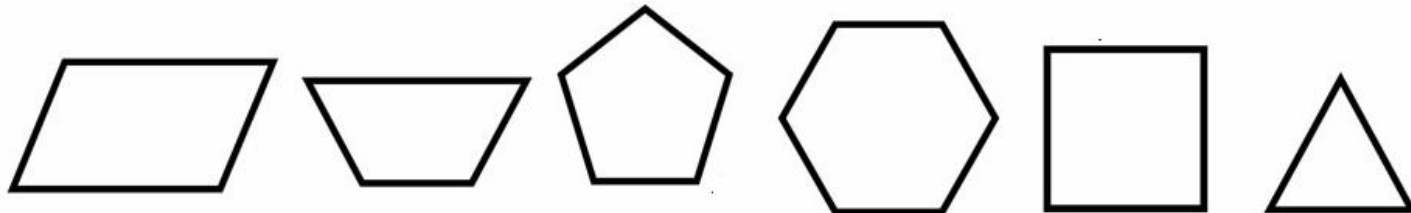
(6) State the number of edges, faces and vertices the cuboid in Question (4) has.

(7) Plot the points $(1,1)$, $(1,2)$ and $(2,1)$ on the grid below and connect the points to make Shape A.
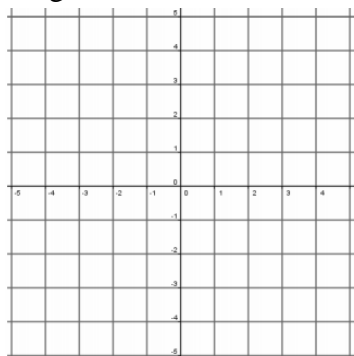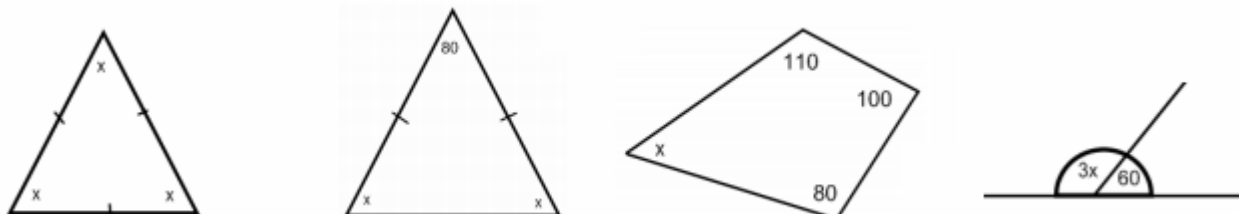
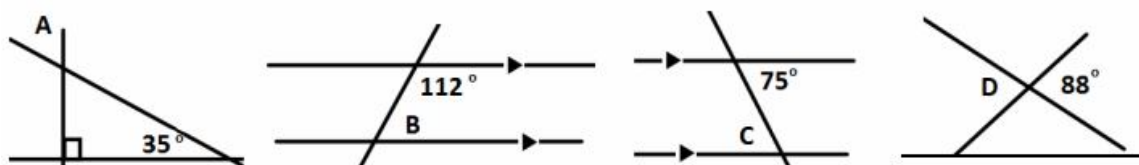| Translate Shape A by $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$	Reflect Shape A in the line $x = 3$	Rotate Shape A 180° clockwise about $(0,0)$	Enlarge Shape A by a scale factor of 3.

(8) State the line **and** rotational symmetry of each shape below:

_____
_____

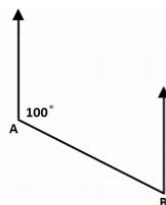(9) Find the value of x in each of the diagrams below.

_____

(10) Find the values of A.B.C and D in the diagrams below. <u>You must give a reason for your answer</u>.

_____
_____

(11) Find:
(a) The bearing of B from A
(b) The bearing of A from B

_____

(12) Find the missing length in each of the triangles below.

_____
_____
_____
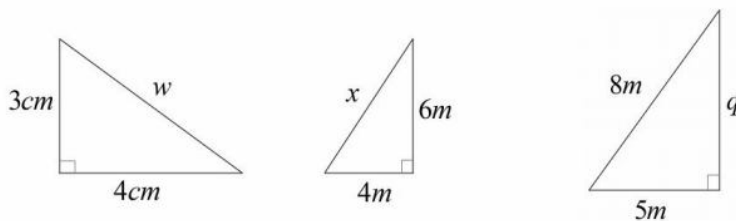
(13) (a) John travels at 4mph for 3 hours. Find the distance he covers.
(b) Jane travels 10 miles in half an hour. Find her average speed.
(c) Colin travels 8 miles at a speed of 24mph. Find how long it takes him giving your answer in minutes.
_____
_____

(1) Without using a calculator, find the value of 324×67

_____
_____

(2) Without using a calculator, find the value of $88 \div 6$

_____
_____

(3) Round each of the following numbers to (a) 1 decimal place and (b) 2 decimal places:
(i) 24.637_____ (ii) 104.374_____(iii) 42.699_____

(4) Round each of the following numbers to (a) 1 significant figure and (b) 2 significant figures:
(i) 243_____ (ii) 18.3_____(ii) 32.6_____

(5) Without using a calculator, find the value of:
(a) $2 + 4 \times 3$_____ (b) $6 - 4 \div 2$_____ (c) $(2 \times 3 + 1)^2$ _____

(6) Convert each of the following into percentages:

(a) 0.23_____ (b) 0.8_____(c) $\dfrac{1}{5}$ _____ (d) $\dfrac{3}{4}$ _____

(7) Convert each of the following into decimals:

(a) $\dfrac{1}{4}$ _____ (b) 29% _____ (c) 5% _____ (d) $\dfrac{6}{5}$ _____

(8) Convert each of the following into fractions. Give your answer in its simplest form:
(a) 3% _____(b) 0.4 _____ (c) 38% _____ (d) 0.12 _____

(9) Find 10%, 15% and 22% of £40.

_____

(10) (a) Increase £35 by 11%
(b) Decrease 24kg by 15%

_____

(11) Find $\dfrac{3}{5}$ of £60 and £80.

_____

(12) Simplify each of the following fractions:

(a) $\dfrac{6}{8}$ _____ (b) $\dfrac{5}{15}$ _____ (c) $\dfrac{20}{100}$ _____ (d) $\dfrac{a}{4a}$ _____

(13) Without using a calculator find the following:

(a) $\dfrac{1}{5} + \dfrac{2}{3}$ _____ (b) $\dfrac{2}{3} - \dfrac{1}{4}$ _____ (c) $\dfrac{3}{5} \times \dfrac{2}{7}$ _____ (d) $\dfrac{3}{4} \div \dfrac{5}{6}$ _____

(14) Without using a calculator find the following:
(a) -2×-3_____ (b) $24 \div -8$_____ (c) $5(-4)$_____ (d) $-3 - -5$_____

(15) Without using a calculator find the following:
(a) 2^3 _____ (b) $\sqrt{81}$ _____ (c) $\sqrt{121}$ _____(d) 3^4 _____

(16) Simplify each of the following:

(a) $p^5 \times p^2$ _____ (b) $p^6 \div p^3$ _____ (c) $100^4 \div 100^2$ _____ (d) $2p^4 \times 3p$ _____

(17) Write out the factors of 36 in ascending order.

_____

(18) List 5 multiples of 8.

_____

(19) List out the first 10 prime and square numbers.

_____

_____

(20) Find the HCF (Highest Common Factor) and LCM (Lowest Common Multiple) of the following:

(a) 6 and 8_____ (b) 12 and 15_____ (c) 5 and 10_____

(21) Express 36 as a product of its prime factors.

_____

(22) Simplify the following ratios:

(a) $4:8$ _____ (b) $6:8$ _____ (c) $15:10$ _____ (d) $300:10$ _____

(23) Share £24 in the ratio 5:3

_____

(24) Some money is shared in the ratio 1:2:4 between Bob, Cassie and Dan. Given that Cassie has £12, find out how much each the other two have.

_____

(25) 8 Pens cost £3.20. Find the cost of 15 identical pens **after** a 10% discount.

_____

(26) A recipe requires 100g of flour, 120g of sugar and 40g of butter to make 8 cakes. Find out how much of each ingredient you would need to make 5 cakes.

_____

_____

(27) Which is best value for money? 250g of sugar for 80p or 350g of sugar for £1.02.

_____

(28) Write down the reciprocal of 5. Is your answer an integer or not?

_____

(29) In a school 40% of the students have black hair, 1/8 have blonde hair, 0.2 have brown hair and the rest are ginger. What proportion of the students at the school are ginger?

_____

(30) Nine tenths of a number of 27. Find ¾ of the number.

_____

(31) Fred scored 16 out of 20 in a test. Freda scored 18 out of 25 in a test. Who had the highest proportion of correct answers? You must show your workings.

_____

(32) Show that 3/8 ths of any number is less than 40% of the same number.

_____

Foundation Handling Data and Probability www.m4ths.com

(1) Find the mean, median, mode and range from the numbers 5, 1, 4, 11, 13, 1, 4, 17, 6, 9, 2

_____
_____
_____

(2) (a) Draw an ordered stem and leaf diagram for the following data set: 12, 23, 26, 15, 19, 30, 8, 23, 51, 42

(b) State the modal value and show that the range of the data set is greater than the median.
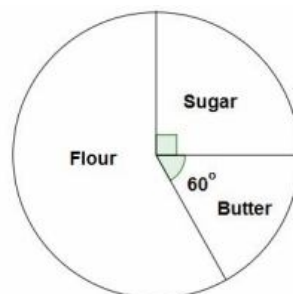
_____
_____

(3) The bar chart below shows some information about peoples favourite colours in a Class 11Y.
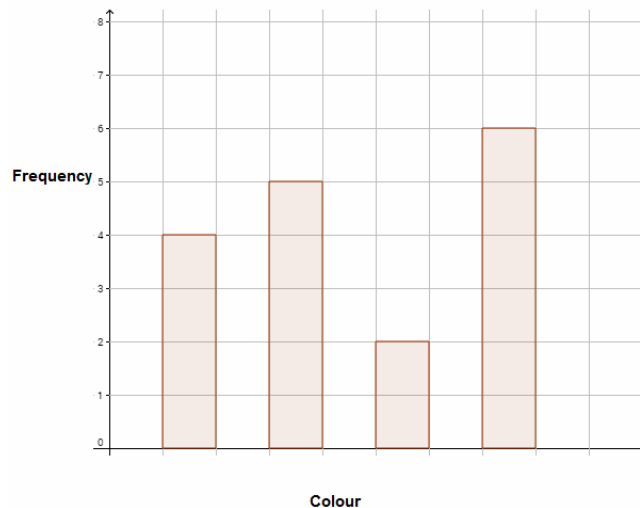
- The modal colour was green.
- One person chose pink.
- Twice as man people chose black as they did red.
- The rest of the people chose blue.
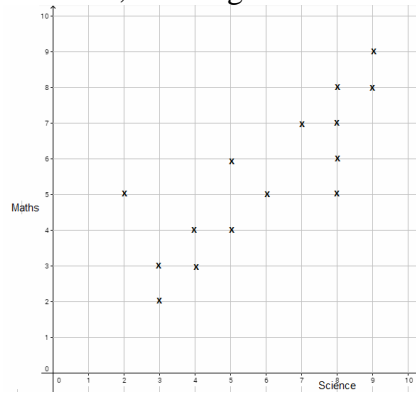
Complete the bar chart.

(4) The pie chart below shows ingredients used to make a cake.

(a) Given that the total weight of the ingredients was 180g, find how much of each ingredient was used.

_____
_____
_____

(b) Complete the sentence " Sugar made up _____% of the ingredients used."

(5) The Graph below shows the scores, out of 10, a class got in their Maths and Science tests.

(a) State the type of correlation the graph shows_____

(b) A child scored 9 on their Maths test and 3 on their Science test. Plot this on the graph.

(c) Find an estimate for the Science test score for a child who scored 6 in their Maths test._____

(6) A survey was carried out about the colour of cars in a car park. Some of the information is displayed below.

(a) Name the diagram representing this information.
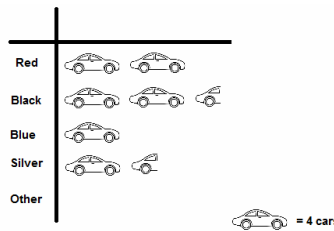
(b) Given that there were 12 'Other' cars recorded, complete the diagram.

(c) One car was chosen at random from the survey. Find the probability that it was (i) A Red car (ii) A Silver car (iii) Not a Black car and (iv) A motorbike.

_____

_____

(7) Study the word INTERVENTION. One letter is chosen at random. Find the probability it's:

(a) A vowel_____ (b) The letter I_____(c) Not the letter T or O_____(d) The letter X_____

(8) Fred plays darts. The probability that he wins is 0.45. Fred can either win or lose, he cannot draw.

(a) Find the probability that Fred loses._____

(b) If Fred plays 200 games how many games would you expect him to win._____

(9) A bag has 4 different colour counters in. The probability of each is shown below.

Colour	Red	Black	Green	Yellow
Probability	¼	x	x	0.35

(a) Find the value of x _____

(b) Given that there are 20 Red counters in the bag find the number of Yellow counters in the bag.

(c) 20 more counters are added to the bag. The probability of picking a yellow is now 0.48. How many of each colour counter was added to the bag?

(10) At a party there are 42 people. 25 take Coke, 18 take Lemonade and 12 take both Coke and lemonade. One person is chosen at random from the party. Find the probability the person:

(a) Takes neither Coke nor Lemonade_____ (b) Takes Coke only_____ (c) Doesn't take Lemonade_____

(11) 100 People work in an office. The two way table below shows information about them.

	Black Hair	Blonde Hair	Brown/Other Hair	
Left Handed	24	16		60
Right Handed		8		
	28			

(a) Complete the table

(b) One person is chosen at random. Find the probability it's:

(i) A person with Brown/Other Hair_____ (ii) A Right handed person with black Hair_____