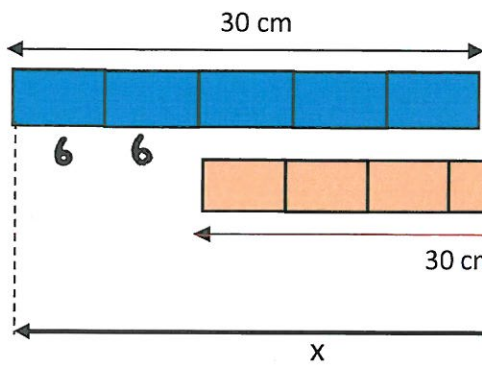


1. Calculate the total length marked with x



$$30 \div 5 = 6 \quad (1)$$

$$30 + 6 + 6 = 42 \text{ cm}$$

(1)

42 cm (2)

2. Calculate $3 + 5 \times 2 - 4$

$$3 + 10 - 4 \quad (1)$$

$$= 9$$

(1) 9 (2)

3. Complete the following with $+$ $-$ \times or \div in order to make them correct.

a) $m \div m \div m = 3m \quad (1)$

b) $m \times m \times m \times m = m^4 \quad (1)$

c) $R \div R = 1 \quad (1)$

d) $6x \div 2 = 3x \quad (1)$

.....(4)

4. Find the value of R

$$(8 \times R) - 5 = 11$$

$$(1)$$

$$8R = 16$$

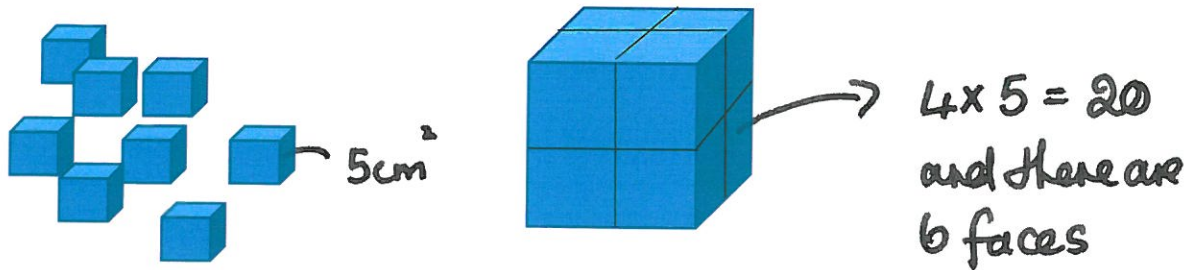
$$R = 2 \quad (1)$$

2 (2)

5. Joe has 8 small cubes.

One of these small cubes has a surface area of 30 cm^2

He joins them together to make one large cube.



Find the surface area of the large cube.

Area of one face of a small cube = $30 \div 6 = 5$

Surface area of large cube = $6 \times 20 = \underline{\underline{120 \text{ cm}^2}}$

.....(3)

6. Add together the following numbers giving your answers in figures.

Twenty-seven

Four hundred

Two hundred thousand

One thousand and three

$$\begin{array}{r} 27 \\ 400 \\ 200000 \\ 1003 \\ 201430 \\ 1 \end{array}$$

201430 (2)

7. Look at the addition sum below.

Some of the digits are missing.

Write the correct missing digits in the boxes

$$\begin{array}{r} 2 \quad \boxed{3} \quad 8 \\ \boxed{4} \quad 5 \quad 7 \\ \hline 6 \quad 9 \quad 5 \\ 1 \end{array}$$

$$\boxed{2} \quad \boxed{3} \quad \boxed{8} + \boxed{4} \quad \boxed{5} \quad \boxed{7} = \boxed{6} \quad \boxed{9} \quad \boxed{5}$$

① for any 2 correct
① for all correct

.....(2)

8. Fill in the missing digits in the boxes below

$$\boxed{5} \times \boxed{7} \times \boxed{11} = 385$$

①

385 is divisible by 5

$$\begin{array}{r} 077 \\ 5 \overline{)385} \\ \underline{35} \\ 35 \\ \underline{35} \\ 0 \end{array}$$

①

(2)

9. Here are the prices of packs of pencils from two different shops

Supermarket

Pack of 5 pens
£6.25

Corner Shop

Pack of 6 pens
£7.20

I need to buy **30 pens**.

How many packs would I need to buy from the Supermarket?

6 packs.....(1)

How many packs would I need to buy from the Corner Shop?

5 packs.....(1)

Which shop gives me better value for money?

You need to give your reasons for your answer.

$$\begin{array}{r} 6.25 \\ \times 6 \\ \hline 37.50 \\ 13 \end{array}$$

①

$$\begin{array}{r} 7.20 \\ \times 5 \\ \hline 36.00 \\ 1 \end{array}$$

The Corner Shop is better value for money as it is cheaper than the supermarket

①

(2)

10. Two bags of crisps and a banana cost £1.80
One bag of crisps and a banana cost £1.10

How much does one banana cost?

$$\square \square \cup = 180p$$

$$\square \cup = 110p$$

So $\square = 70p$ ①

$\cup = 40p$ ①

40p.....(2)

11. Jonny spends £2.10 for a pen and a book.
The book costs 50p more than the pen.
How much did each item cost?

pen book + 50p
80p 80p + 50p
80p 130p

$$\begin{array}{r} 210 \\ - 50 \\ \hline 160 \end{array} \quad (1)$$

$$160 \div 2 = 80p$$

80p and £1.30 (2)

12. Write down all of the letters of the word HEXAGON that have line symmetry and rotational symmetry.

Line symmetry
Rotational symmetry

H E X A O (1)
✓ X ✓ X ✓
H X O (2)

13. A television costs £420 in the sale.
This is after a reduction of $\frac{1}{3}$

How much was the normal price before the tv was reduced?

210	210	$\frac{1}{3}$
-----	-----	---------------

← 420 →

$$\frac{2}{3} = 420$$

$$\text{so } \frac{1}{3} = 210$$

$$\text{so } \frac{3}{3} = 210 \times 3 = 630$$

£630 (3)

14. Put these in order of size starting with the smallest first:

1.45 1.048 0.987 5.34 0.7 0.008

1.450 ②

1.048 ③

0.987

5.340 largest ①

0.700

0.008

↑ ↑

0.008, 0.7, 0.987, 1.048, 1.45, 5.34 (2)

① for one error

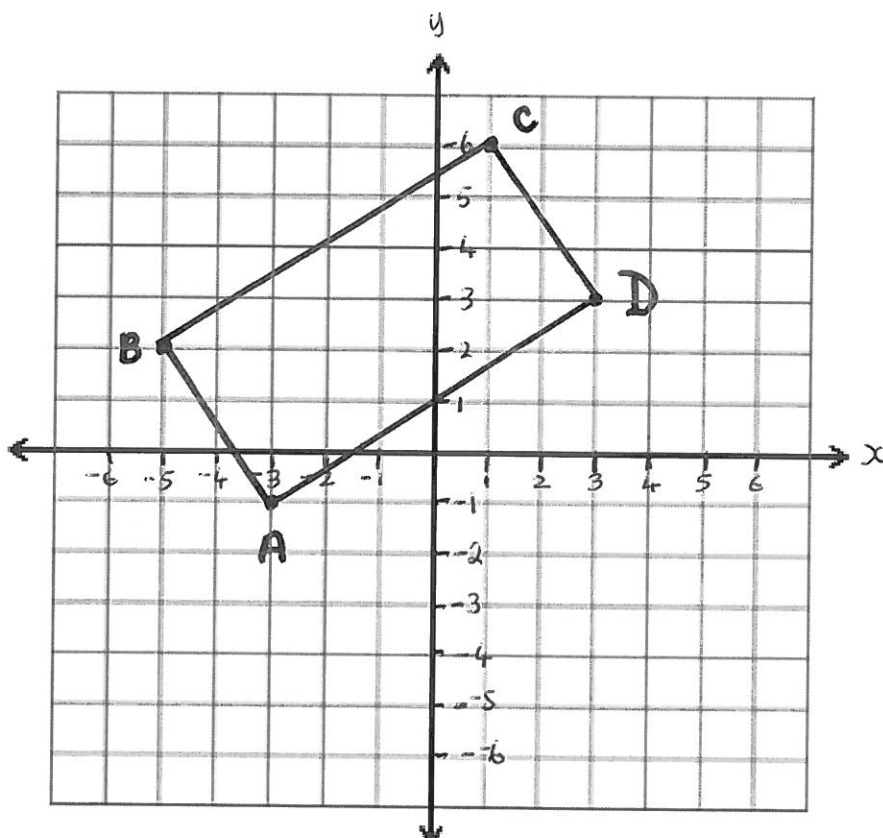
① for all correct

15. The point A has coordinates (-3, -1)

Write down the coordinates of B (-5, 2) (1)

Write down the coordinates of C (1, 6) (1)

Now plot the point D such that the shape ABCD forms a rectangle. (2)



16. Suzi is 10 years old. Her father is 32 years old.

How old will Suzie be when her father is 10 times her age 6 years ago?

	Suzie	Father
① 6 yrs ago	4	
Now	10	32
	18	40

$$4 \times 10 = 40$$

①

+ 8 yrs

①

18 years old (3)

17. Fill in the missing numbers in the following number sequences:

+1 +2 +3 +4 +5 +6

a) 5, 6, 8, 11, 15, 20, 26

(1)

$\div 2 \div 2$

b) 32, 16, 8, 4, 2, 1, $\frac{1}{2}$

$$2 \div 2 = 1 \quad 1 \div 2 = \frac{1}{2}$$

(1)

①

c) 1, 1, 2, 3, 5, 8, 13, 21, 34

(1)

$$1+1=2$$

$$1+2=3$$

$$2+3=5$$

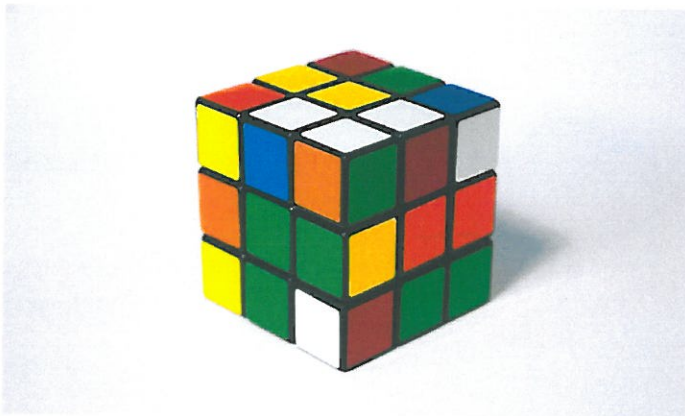
$$3+5=8$$

$$5+8=13$$

$$\text{So } 8+13=21$$

$$13+21=34$$

18. Here is a Rubics Cube. All of the outside faces are painted.



- a) How many of the cubes are painted on exactly one face?

6.....(1)

- b) How many of the cubes are painted on exactly two faces?

12.....(1)

- c) How many of the cubes are painted on exactly three faces?

8.....(1)

19. Helen chooses a number.

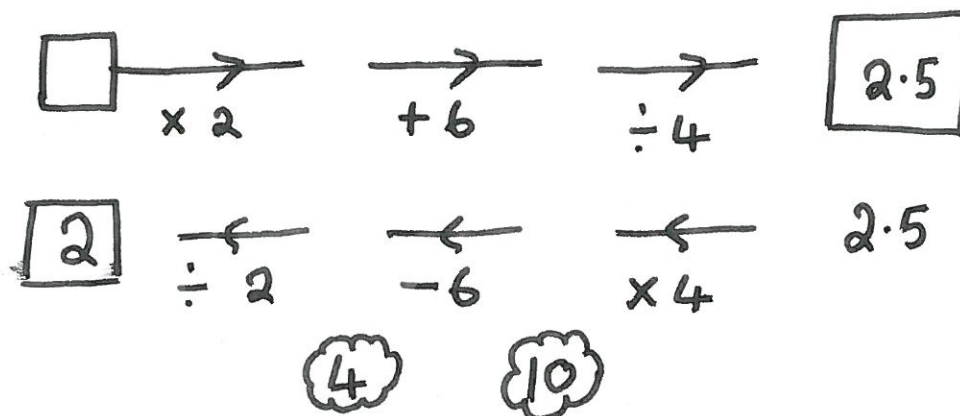
She multiplies her number by 2 and then adds 6.

She divides the result by 4.

Her answer is 2.5.

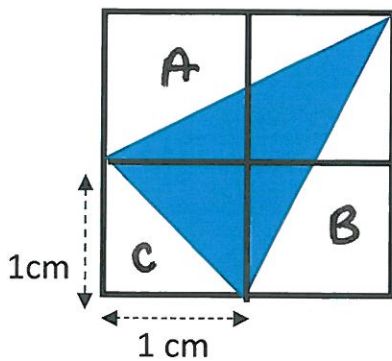
$$\begin{array}{r} 2.5 \\ \times 4 \\ \hline 10.0 \\ 2 \end{array}$$

What was the number Helen started with?



2..... (3)

20.



The blue triangle is inside a square made up of four smaller squares.

Each of the small squares has an area of 1 cm^2

What is the area of the triangle?

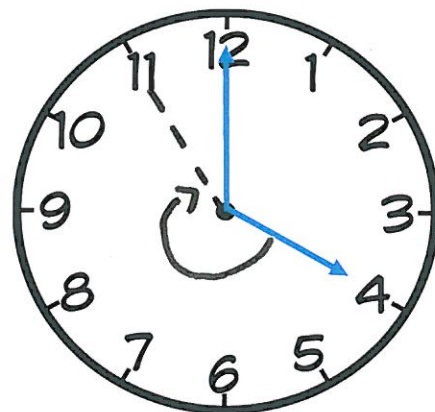
$$\begin{aligned} \text{Area of A} &= \frac{1 \times 2}{2} = \frac{2}{2} = 1 \\ \text{Area of B} &= \frac{1 \times 2}{2} = \frac{2}{2} = 1 \\ \text{Area of C} &= \frac{1 \times 1}{2} = \frac{1}{2} \end{aligned} \quad \left. \vphantom{\begin{aligned} \text{Area of A} \\ \text{Area of B} \\ \text{Area of C} \end{aligned}} \right\} \begin{array}{l} \text{total area of white} \\ \text{triangles} = 1 + 1 + \frac{1}{2} = 2\frac{1}{2} \end{array} \quad \textcircled{1}$$

$$\begin{aligned} \text{Area of large square} &= 2 \times 2 = 4 \\ \text{Shaded triangle} &= 4 - 2\frac{1}{2} = 1\frac{1}{2} \quad \textcircled{1} \end{aligned} \quad \dots \underline{\underline{1\frac{1}{2} \text{ cm}^2}} \dots \textcircled{1} \dots (3)$$

21. Here is a clock face. The time is 4 pm.

a) How many degrees are there in the smallest angle between the hour hand and the minute hand?

$$\begin{aligned} 20 \text{ minutes} &= \frac{1}{3} \text{ hour} \\ \frac{1}{3} \text{ of } 360^\circ &= \underline{\underline{120^\circ}} \\ &\dots\dots\dots(1) \end{aligned}$$



b) How many degrees has the hour hand moved when it is 11 pm?

$$12 \text{ to } 1 = \frac{1}{12} \text{ of } 360^\circ = 30^\circ \quad \textcircled{1}$$

$$4 \text{ to } 11 = 7 \times 30 = 210^\circ$$

$$\dots \underline{\underline{210^\circ}} \dots \textcircled{1} \dots (2)$$

22. Put these values in order of size, smallest to largest.

④
 2^5

②
 3^2

⑤
 4^3

①
 1^6

③
 5^2

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$$

$$3^2 = 9$$

$$4^3 = 4 \times 4 \times 4 = 64$$

①

$$1^6 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$$

$$5^2 = 5 \times 5 = 25$$

①

$1^6, 3^2, 5^2, 2^5, 4^3$(2)

23. Five students take a test. The mean of their marks is 11.
Another student takes the test.
The mean of the six students is now 10.

What is the mark of the sixth student?

Five students $\frac{\square + \square + \square + \square + \square}{5} = 11$

Their total = 55 ①

Six Students $\frac{\bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc}{6} = 10$

Their total = 60

$$60 - 55 = 5$$

①

5.....(2)

24. There are 20 balls in a bag.
A quarter of the balls are red.
Three fifths are yellow.
The rest are green.

$$\frac{1}{4} \text{ of } 20 = 5 \text{ red balls } \textcircled{1}$$

$$\frac{3}{5} \text{ of } 20 = 4 \times 3 = 12 \text{ yellow balls}$$

- a) How many green balls are there?

$$20 - (5 + 12)$$

$$= 20 - 17 = 3 \textcircled{1}$$

3 green balls

- b) What is the probability of choosing a green ball?

$$\frac{3}{20} \dots\dots\dots (1)$$

- c) What is the probability of choosing a black ball?

$$\frac{0}{20} = 0 \dots\dots\dots (1)$$

25. The angles in a triangle are in the ratio of 1 : 2 : 3

Calculate the size of each of the three angles.

Angles in a triangle add up to 180°

$$1 + 2 + 3 = 6$$

$$180 \div 6 = 30^\circ$$

$\textcircled{1}$

$\textcircled{1}$

$$1 \times 30 = 30^\circ$$

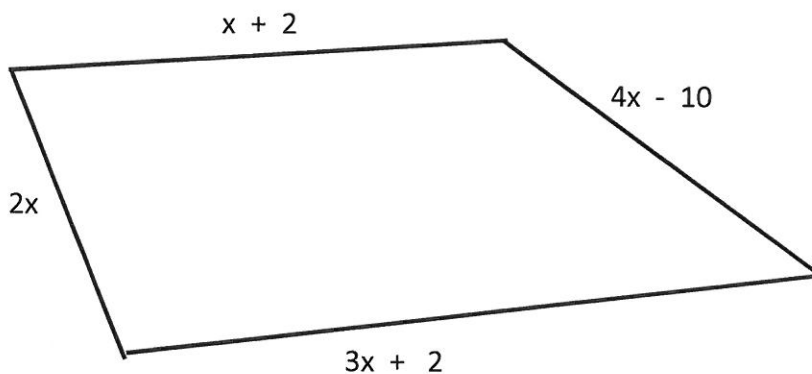
$$2 \times 30 = 60^\circ$$

$$3 \times 30 = 90^\circ$$

$\textcircled{1}$

$$\underline{\underline{30^\circ : 60^\circ : 90^\circ}} \dots\dots\dots (3)$$

26. A quadrilateral is drawn below



a) Find a simplified expression for the perimeter of this quadrilateral

$$x + 2 + 4x - 10 + 3x + 2 + 2x \quad (1)$$

$$= 10x - 6$$

$$\begin{array}{r} (1) \quad (1) \\ \underline{10x - 6} \end{array} \quad (3)$$

b) The perimeter of this quadrilateral is 140 cm.
Find the value of x

$$10x - 6 = 140 \quad (1)$$

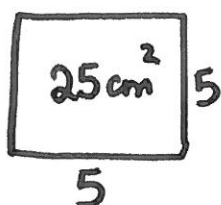
$$10x = 146$$

$$x = \frac{146}{10} = 14.6 \text{ cm} \quad (1)$$

$$\begin{array}{r} (1) \\ \underline{14.6 \text{ cm}} \end{array} \quad (3)$$

27. A square has an area of 25 cm^2

Find the perimeter.



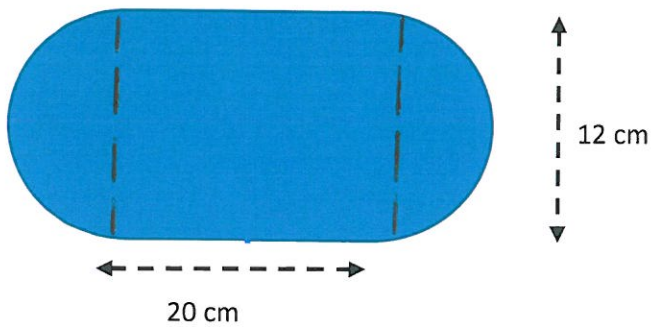
$$(1)$$

$$5 \times 5 = 25$$

$$\text{Perimeter} = 5 + 5 + 5 + 5 = 20$$

$$\begin{array}{r} (1) \\ \underline{20 \text{ cm}} \end{array} \quad (2)$$

28.



This shape is made up of a rectangle with a semi-circle at each end.

The diameters of the semi circles are 12 cm

The length of the straight edge is 20 cm

Find the area of the whole shape.

The two semi circles join together to make one complete circle.



$$\text{radius} = 12 \div 2 = 6$$

Area of this circle using

$$\begin{aligned} A &= \pi r^2 \\ &= \pi \times 6^2 \\ &= 3.14 \times 36 \\ &= 113.04 \text{ cm}^2 \end{aligned} \quad (1)$$

Area of the rectangle

$$\begin{aligned} &= l \times w \\ &= 20 \times 12 = 240 \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Total area} &= 240 + 113.04 \\ &= \underline{\underline{353.04 \text{ cm}^2}} \end{aligned} \quad (1)$$

$$\begin{array}{r} 314 \\ \times 36 \\ \hline 1884 \\ 9420 \\ \hline 11304 \\ \dots\dots\dots(3) \end{array} \quad \begin{array}{r} 113.04 \\ + 240.00 \\ \hline 353.04 \end{array}$$

29. Some children were asked what was their favourite colour.

The table below shows the results as percentages.

Red	Blue	Orange	Yellow	Green
25%	12%	1.5%	1.5%	60%

An equal number of children liked orange and yellow.

a) What percentage liked orange ?

$$\begin{array}{r}
 25 \\
 12 \\
 + 60 \\
 \hline
 97
 \end{array}
 \quad \textcircled{1}
 \quad 100 - 97 = 3 \quad \textcircled{1}$$

$$3 \div 2 = 1.5\%$$

$$\dots \underline{\underline{1.5\%}} \quad (2)$$

b) A total of 200 children were asked.

How many children liked blue?

$$12\% \text{ of } 200$$

$$10\% = 20 \quad \textcircled{1}$$

$$1\% = 2 \quad \textcircled{1}$$

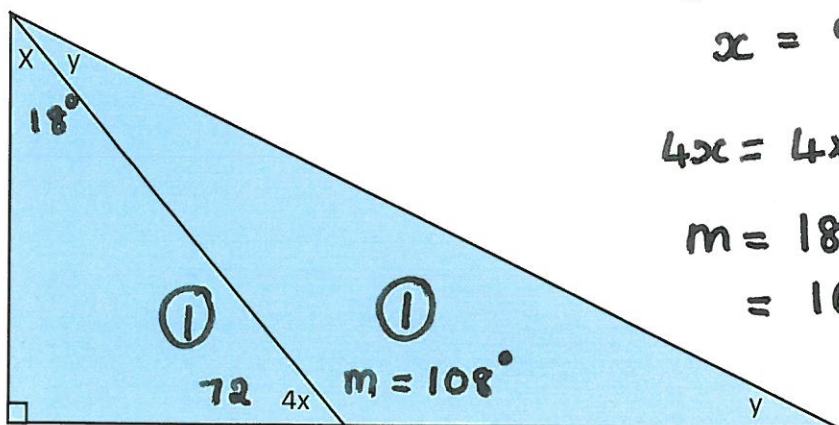
$$12\% = 10\% + 1\% + 1\% =$$

$$20 + 2 + 2 = 24 \quad \textcircled{1}$$

$$\dots \underline{\underline{24}} \dots (2)$$

30. Look at this triangle.

Find the value of x and y



$$4x + x = 5x$$

$$5x = 90$$

$$x = 90 \div 5 = 18 \quad \textcircled{1}$$

$$4x = 4 \times 18 = 72$$

$$\begin{aligned}
 m &= 180 - 72 \\
 &= 108 \quad \textcircled{1}
 \end{aligned}$$

$$\begin{aligned}
 y + y + 108 &= 180 \\
 2y &= 72
 \end{aligned}$$

$$y = 72 \div 2 = 36 \quad \textcircled{1}$$

$$x = \underline{\underline{18}}$$

$$y = \underline{\underline{36}}$$

$$\begin{array}{r}
 18 \\
 5 \overline{) 90} \\
 \underline{90} \\
 0
 \end{array}
 \quad (5)$$

$$\begin{array}{r}
 18 \\
 \times 4 \\
 \hline
 72 \\
 3
 \end{array}$$