



## Reasoning and problem solving questions

I have put together a set of questions to extend your mathematical skills. Each day has some questions followed, on the next page, by the answers and any working that you might find helpful. Don't forget that for these questions there is often more than one way of finding the answer so, as long as your answer is the same as mine, you can assume your method is correct!

Week 1 Monday

Complete

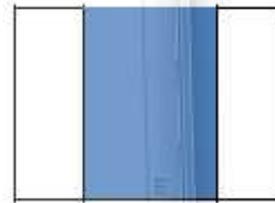
$$40,000 + 7,000 + 600 + 7 = \boxed{\phantom{00000}}$$

$$6,000 + 50 + 300 + 1 = \boxed{\phantom{00000}}$$

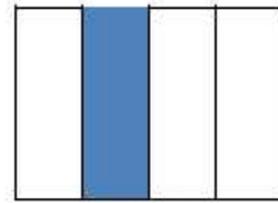
$$5,000 + 200 + \boxed{\phantom{000}} = 5,280$$

$$30,000 + 900 + 3 + \boxed{\phantom{000}} = 36,905$$

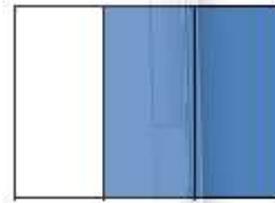
Which diagram has  $\frac{1}{3}$  shaded?



A



B



C



D

Explain the reason for your choice.

Explain why the other diagrams do not have  $\frac{1}{3}$  shaded.

Week 1 Monday ANSWERS

Four equal parts

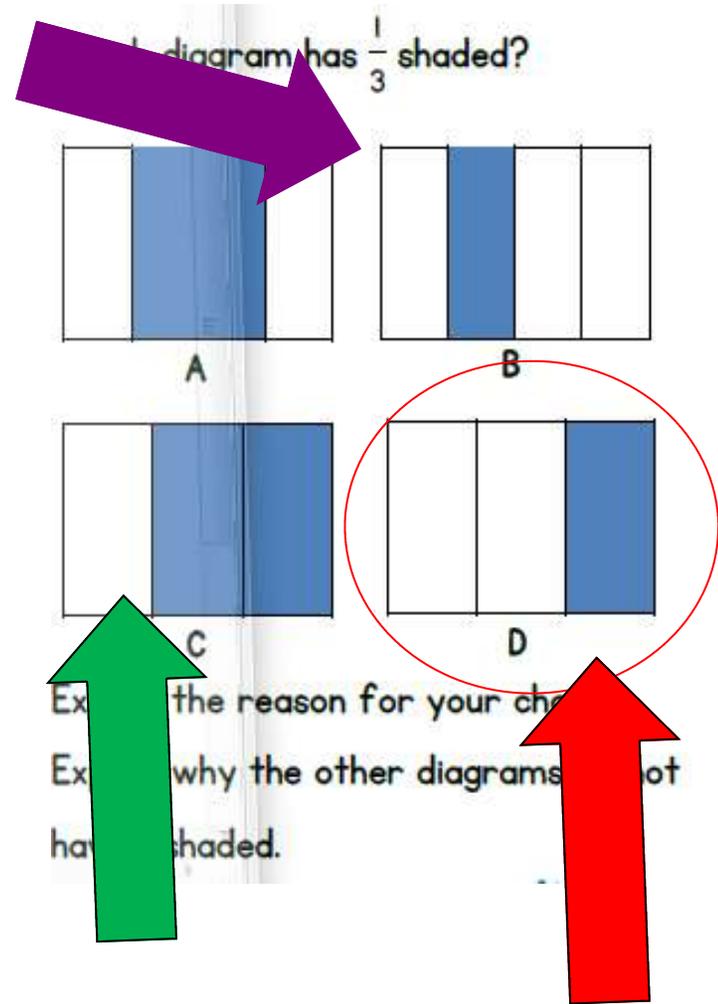
Complete

$$40,000 + 7,000 + 600 + 7 = \boxed{47\,607}$$

$$6,000 + 50 + 300 + 1 = \boxed{6\,351}$$

$$5,000 + 200 + \boxed{80} = 5,280$$

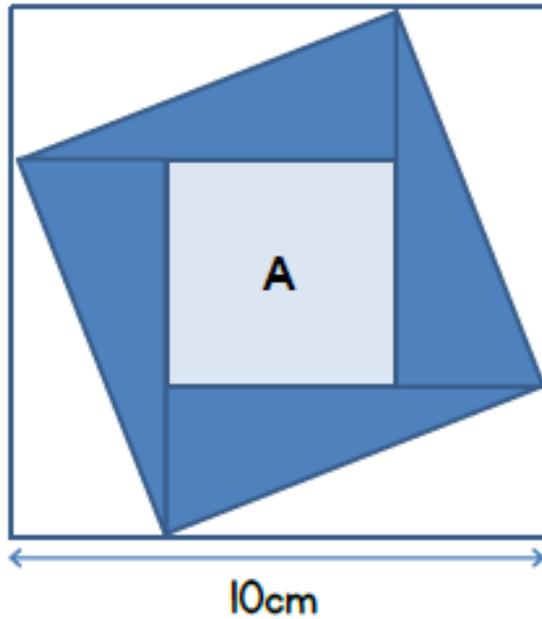
$$30,000 + 900 + 3 + \boxed{47\,607} = 36,905$$



Two parts shaded

One part shaded out of 3 equal parts

Week 1 Tuesday



The area of square A is  $36\text{cm}^2$ .

Find the area of one of the triangles.

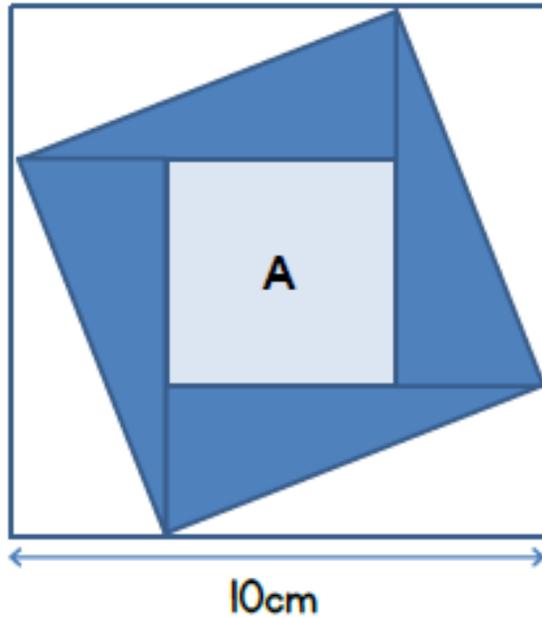
Find the missing values

$$\frac{1}{3} + \frac{\square}{9} = 1$$

$$\frac{1}{4} + \frac{1}{8} + \frac{\square}{16} = 1$$

Calculate

22 tens minus 22 tenths



The area of square A is  $36\text{cm}^2$ .

Find the area of one of the triangles.

Square has sides of 6cm as  $6 \times 6 = 36$

$10 - 6 = 4$  so base of triangle = 2 cm

$10 - 2 = 8$  (height of triangle)

Area of triangle = base  $\times$   $\frac{1}{2}$  height

$8 \times 1 = 8\text{ cm}^2$

Find the missing values

$$\frac{1}{3} + \frac{\boxed{6}}{9} = 1$$

$$\frac{1}{4} + \frac{1}{8} + \frac{\boxed{10}}{16} = 1$$

Calculate

22 tens minus 22 tenths

$$220 - 2.2 = 217.8$$

Week 1 Wednesday

Complete

$$2\frac{\square}{6} = 3\frac{5}{6}$$

A bottle is a third full.



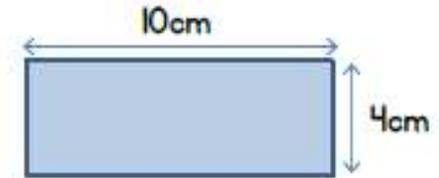
Mary puts 320ml of juice into the bottle.



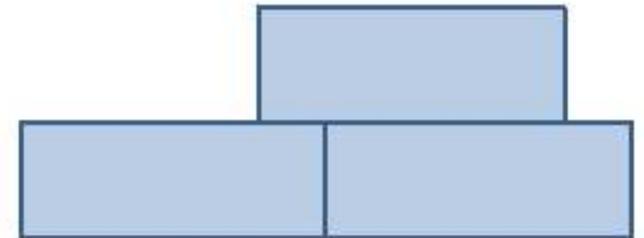
The bottle is now full.

How much juice does the bottle hold when full?

Here is a rectangle.



A new shape is made up of three of these rectangles.



What is the perimeter of the new shape?

Week 1 Wednesday ANSWERS

Complete

$$2\frac{\boxed{11}}{6} = 3\frac{5}{6}$$

A bottle is a third full.



Mary puts 320ml of juice into the bottle.



The bottle is now full.

How much juice does the bottle hold when full?

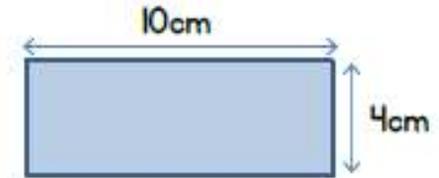
320 is two thirds

160 is one third

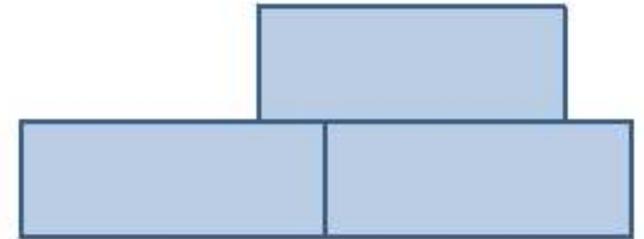
480 is three thirds

480ml is bottle capacity

Here is a rectangle.



A new shape is made up of three of these rectangles.



What is the perimeter of the new shape?

4 long sides and 4 short sides

$$4 \times 10 = 40, 4 \times 4 = 16$$

$$40 + 16 = 56$$

$$\text{Perimeter} = 56 \text{ cm}$$

Week 1 Thursday

Complete

$$4 \times 6 + 5 \times 6 = \boxed{\phantom{00}} \times 6$$

$$7 \times 6 + 12 = \boxed{\phantom{00}} \times 6$$

$$6 + 60 + 600 = \boxed{\phantom{00}} \times 6$$

$$12 \times 6 + 7 \times 6 = \boxed{\phantom{00}} \times 6 - 24$$

Yesterday at a museum



- $\frac{4}{5}$  of the visitors were adults.
- 120 children visited the museum.
- $\frac{3}{8}$  of the adults were male.

How many male adults visited the museum yesterday?

Complete

$$4 \times 6 + 5 \times 6 = \boxed{9} \times 6$$

$$7 \times 6 + 12 = \boxed{9} \times 6$$

$$6 + 60 + 600 = \boxed{111} \times 6$$

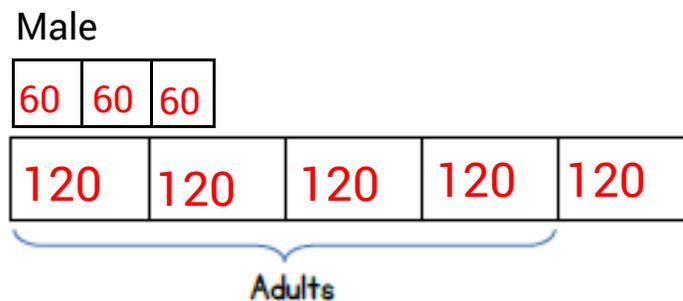
$$12 \times 6 + 7 \times 6 = \boxed{15} \times 6 - 24$$

## Yesterday at a museum



- $\frac{4}{5}$  of the visitors were adults.
- 120 children visited the museum.
- $\frac{3}{8}$  of the adults were male.

How many male adults visited the museum yesterday?



I used a bar model to find the answer of 180 male adults.

Week 1 Friday

(a) The area of a square is  $64\text{m}^2$



What is the perimeter of the square?

(b) A rectangle is 2cm longer than it is wide.



The perimeter of the rectangle is 44cm.

Find the area of the rectangle.

Maria has three number cards.



One of the cards has a value of 35

The other cards have a smaller value.

When you add the cards you get.

$$\text{Red card} + \text{Purple card} = 62$$

$$\text{Green card} + \text{Purple card} = 38$$

$$\text{Red card} + \text{Green card} = 46$$

What is the value of each card? ..

Week 1 Friday ANSWERS

(a) The area of a square is  $64\text{m}^2$



$$64 = 8 \times 8$$

$$8 \times 4 = 32$$

32 cm

What is the perimeter of the square?

(b) A rectangle is 2cm longer than it is wide.



The perimeter of the rectangle is 44cm.

Find the area of the rectangle.

Half of 44 is 22

Length 12, width 10

$$12 \times 10 = 120$$

Area = 120 cm<sup>2</sup>

Maria has three number cards.



One of the cards has a value of 35

The other cards have a smaller value.

When you add the cards you get.

$$\text{Red card} + \text{Purple card} = 62$$

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What is the value of each card? ..

