

## Simplifying ratio

Write in simplest terms using integers:

a)  $6 : 15 : 12 = 2 : 5 : 4$

b)  $\frac{2}{3} : \frac{3}{4} = 8 : 9$

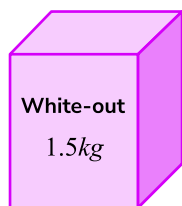
c)  $0.6 : 0.15 = 4 : 1$

## Direct proportion

The variables  $g$  and  $h$  are related such that  $h$  is proportional to the square of  $g$ . Complete the table of values.

$g$	2	4	5
$h$	3	12	18.75

## Best buys



£4.80



£2.50

Which box of laundry detergent is the best value for money? Show your reasoning clearly.

**Mighty Clean**

e.g

White-out is 3.125g per penny

Mighty Clean is 3.2g per penny

## Multiplicative reasoning

Jani is making cupcakes with the following recipe:

How much of each ingredient would Jani need to make 30 cupcakes?

**24 cupcakes**

- 300g butter
- 280g sugar
- 220g flour
- 4 eggs

375g butter

350g sugar

275g flour

5 eggs

## Inverse proportion

You are told that  $y$  is inversely proportional to  $x$ . Given that  $y = 12$  when  $x = 8$  calculate the value of

a)  $y$  when  $x = 3$       $y = 32$

b)  $x$  when  $y = 15$       $x = 6.4$

## Ratio problems

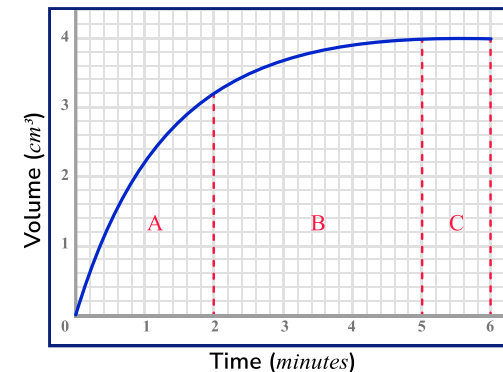
- 1) Addy and Jai own collections of stamps in the ratio 5 : 4. Addy gives Jai 5 stamps and now the ratio is 5 : 7. How many stamps did Addy and Jai each have initially?

= Addy 20, Jai 16

- 2) Red paint costs £3.50 per litre.  
Blue paint costs £2.45 per litre.  
Purple paint is a mixture of red and blue in the ratio 3 : 4.  
Work out the cost of 12 litres of purple paint.  
= £34.80

## Describing rates of change

This graph shows the volume of gas produced in a chemical reaction.



By reference to regions A, B and C describe the rate of the reaction during the six minute period.

E.g Rate of reaction is faster at the start of region A. The reaction slows through region B. The reaction does not occur in region C.

## Velocity-time graphs

Using this velocity-time graph for a particle in motion,

- a) Work out the particle's acceleration between A and B.

=  $20\text{m/s}^2$

- b) Calculate the distance travelled by the particle. = 200m

