

# Ratio, proportion and rates of change

## REVIEW IT!

- In a sale the price of a dress was reduced by 20% to £76.80. What was the original price of the dress?
- The area of floating pond weed that grows on the surface of a pond in  $t$  days is  $A \text{ m}^2$ , where
$$A_0 = 5$$
$$A_{t+1} = 1.02A_t$$
Work out the area covered by the pond plants in
  - 1 day
  - 3 days.Give your answers to 2 decimal places.
- $y$  is inversely proportional to  $x$ .  
When  $x = 2.5$ ,  $y = 4$ .  
Find the value of  $y$  when  $x = 5$ .
- The ratio of the number of students studying history in Year 11 to those not studying history is 2 : 7. There are 54 students studying history. How many students are there in Year 11?
- The price of a house in a certain town has increased by 120% over the last 10 years.  
The original price of the house was £220 000. How much is the house worth now? Give your answer to the nearest £5000.
- £2000 is invested at an interest rate of 2.5% for 5 years. Work out how much money is in the account after 5 years if the interest paid is
  - simple interest
  - compound interest (to the nearest penny).
- Tom goes on holiday to China. The exchange rate is £1 = 8.55 yuan. He changes £400 into yuan.
  - Work out how many yuan he should get.  
After his holiday, Tom has 800 yuan left over which he wants to change back into pounds.  
The travel agent offers an exchange rate of £1 = 8.6 yuan with 2.5% commission.  
The post office offers an exchange rate of £1 = 8.9 yuan with no commission.
    - Should Tom change his money at the travel agent or the post office? Explain your answer.
  - A company is owned by Joshua, Amy and Luke, in the ratio of 3 : 5 : 7.  
Any profits are shared in this ratio.  
When the profits in a certain year were shared, Luke received £4000 more than Amy.  
Work out the total profit for the year.
  - Two solids are mathematically similar. Solid A has a surface area of  $25 \text{ cm}^2$  and solid B has a surface area of  $4 \text{ cm}^2$ .  
The volume of solid A is  $10 \text{ cm}^3$ .  
Find the volume of solid B.
  - The number of male and female members of a swimming club is in the ratio 7 : 4.  
25% of the male members are junior members.  
10% of the female members are junior members.  
Work out the percentage of junior members in the club, giving your answer to the nearest integer.
  - A bronze alloy is made by mixing copper and tin. The masses of the copper and tin are in the ratio 9 : 1.  
The density of copper is  $8.9 \text{ g/cm}^3$ .  
The density of tin is  $7.3 \text{ g/cm}^3$ .  
Work out the density of the bronze alloy. Give your answer to 1 decimal place.