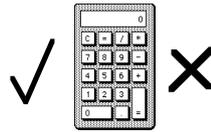


Chapter 41



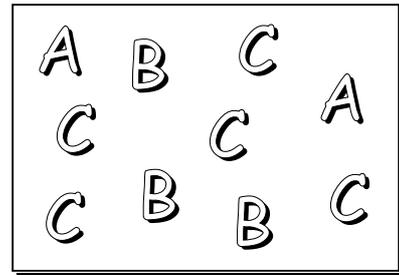
Calculators may be used in this Chapter (where appropriate)

Ratio & Proportion

Exercise 1/2

1. From the letters shown, write down the ratio of :-

- (a) A : B (b) A : C
 (c) C : B (d) B : C
 (e) vowels : consonants

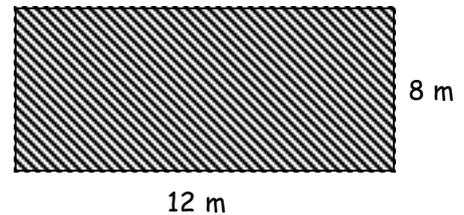


2. Copy each ratio and simplify as far as possible :-

- (a) 5 : 10 (b) 12 : 36 (c) 4 : 20 (d) 5 : 35
 (e) 27 : 3 (f) 36 : 16 (g) 100 : 8 (h) 240 : 30
 (i) 25 : 625 (j) 12 : 16 : 24 (k) 8 : 40 : 72 (l) 6 : 81 : 333

3. A rectangular garden measures 12 metres by 8 metres. Write down the ratio (in its simplest form) of :-

- (a) length : breadth (b) perimeter : area



4. Simplify each of the following to unitary ratios :-

- (a) $\frac{1}{2} : 6$ (b) $\frac{1}{3} : 9$ (c) 12 : 0.2 (d) $\frac{1}{17} : 10$

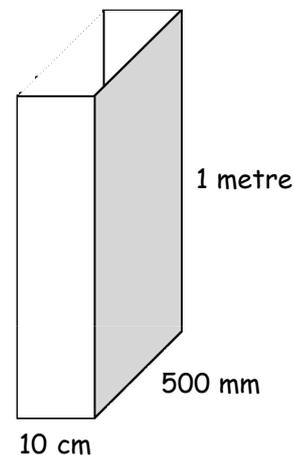
5. Change each quantity to similar units and simplify :-

- (a) $\frac{1}{2}$ kg : 200 g (b) $\frac{1}{3}$ hour : 10 mins (c) 50 mm : $\frac{1}{5}$ cm (d) $\frac{1}{8}$ litre : 250 ml

6. A box with no lid has length 10 centimetres, breadth 500 millimetres and height 1 metre.

Write in its simplest form the ratio of :-

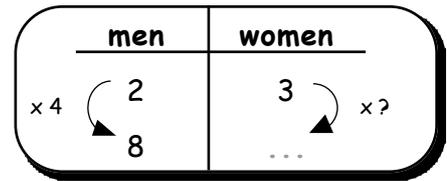
- (a) length : breadth
 (b) height : volume



Exercise 3

1. On a small aircraft, the ratio of men to women is 2 : 3.

If there are 8 men on the aircraft, how many women are there ?



2. The ratio of girls to boys in 3C₂ is 4 : 5.

(a) If there are 12 girls, how many boys are there ?

(b) If there are 20 boys, how many girls are there ?

3.



A model Ferarri has a scale of 1 : 43.

(a) The model has a tyre diameter of 2 cm.

What will the tyre diameter be on the Ferarri ?

(b) The Ferarri has a height of 129 centimetres.

What is the height of the model ?

4. Farmer Ellis uses the table of ratios to feed his chickens using chicken feed and corn.

Mix in the ratio	
Strength	Feed : Corn
Weak	10 : 1
Light	7 : 1
Medium	7 : 2
Strong	5 : 3
Very Strong	4 : 5

Which feed strength will he get if he mixes :-

(a) 70g of feed and 10g of corn ?

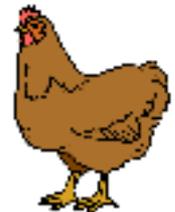
(b) 210g of feed and 60g of corn ?

(c) 1 kg of feed and 1250g of corn ?

(d) 600g of corn and 1 kg of feed ?

5. Farmer Ellis has a 30g bag of corn.

How much chicken feed does he need to make *medium strength* feed ?



Exercise 4

1. Share £250 between Ann and Kim in the ratio 2 : 3.

COPY and complete :-



Ann

Total number of shares = 2 + 3 = <u>5</u>
Each share = £250 ÷ <u>5</u> = £50
Ann has 2 shares = 2 × £..... = £.....
Kim has 3 shares = 3 × £..... = £.....

Kim



(Check total is £250)

2. Show all your working for each of the following :-

- Share £1500 between Bill and Ben in the ratio 3 : 2.
- Share 360 sweets between May and Matt in the ratio 5 : 7.
- Share 1250 €'s between Tom and Tim in the ratio 7 : 3.
- Share ten thousand pounds between Dan and Fran in the ratio 23 : 27.

3. Every week Jack pays £3, and Jill pays £4 into a church raffle.

If they share the top prize (£140), in the ratio of their stake, how much should each receive ?

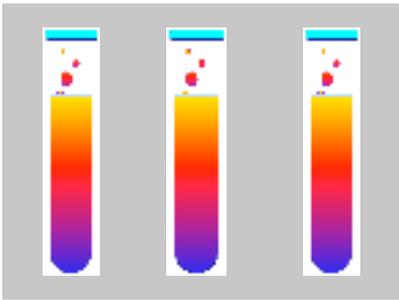
4. Ed and Ted win half a million dollars on an internet lottery.

They decide to share the money in the ratio 13 : 12.

How much more will Ed receive than Ted ?



5.



A chemist requires a special mix of three chemicals CtP, AgH and RcQ in the ratio of

$$\frac{1}{2} \text{ litre} : \frac{1}{4} \text{ litre} : 2500 \text{ ml.}$$

If the chemist has 1 litre of RcQ, how much of the other chemicals does he require for the correct mix ?

Exercise 5/6

1. (a) The cost of four magazines is £6. Find the cost of one magazine.

(b) Seven football strips cost £210. Find the cost of one strip.

(c) Eight sweets cost £2. Find the cost of one sweet.



2.



The cost of ten calculators is £50.

How much would it cost for :-

(a) one calculator (b) nine calculators ?

3. A car travels 140 kilometres in 4 hours.

Assuming the car travels at the same speed, how far will it travel in :-

(a) 3 hours

(b) 5 hours

(c) 30 minutes ?



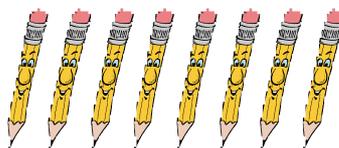
4. A photocopy machine can produce 300 copies in 2 minutes.

How many copies will the machine make in :-

- (a) 3 minutes
- (b) 11 minutes
- (c) 30 seconds
- (d) 20 seconds ?



5. (a) 600 pencils cost £24.
Find the cost of 400 pencils.



(b) A disc spins 3000 times in 8 minutes.
How many times will it spin in 12 minutes ?

(c) A computer makes three million calculations in 9 seconds.
How many calculations will the computer make in 12 seconds ?



Exercise 7

1. (a) Copy and complete the table.

(b) Plot each point (1, 4), (2, 8), ...
on a graph.

(c) Join the points with a straight line.

(d) Explain why the line must go through the origin.

No. of sweets	1	2	3	4	5	6
Cost (p)	4	8				

2. (a) Draw a set of axes and plot the
points from the table.

(b) Explain how you might check for
direct proportion without drawing
axes and plotting points.

x	1	2	3	4
y	2	4	6	8

=> (1, 3), ..., etc.

3. Which of the following tables indicate direct proportion ?

(a)

x	1	2	3	4
y	7	14	21	28

(b)

x	1	2	3	4
y	6	11	17	24

(c)

x	2	4	6	8
y	3	6	9	12

(d)

x	2	4	6	8
y	13	17	21	25

Exercise 8

1. If it took two men 6 hours to build a wall, how long would it have taken 3 men ?
(Remember : more men - less time)
2. If it took 7 park wardens 6 hours to clear away litter, how long would it have taken 3 wardens ?
3. Six men take 6 hours to build a kit car. How long will it take eight men ?

4.



Nine scouts have eight days rations.
How many days rations would there then be if **three more** scouts join them ?

5. Oliver and his 5 friends take an hour to wrap all the presents for the church tombola. How long would it have taken if 4 **more** friends had helped with the wrapping ?
6. Five bees take eight days to make 5 millilitres of honey.
How many bees would it take to make the same amount in ten days ?



Exercise 9

For each of the following questions show all your working.

1. Tony buys ten stamps for £2.90. How much would he pay for 12 stamps ?
2. Henry can run 4 kilometres in 20 minutes.
How long would he take to run 5 kilometres at this speed ?

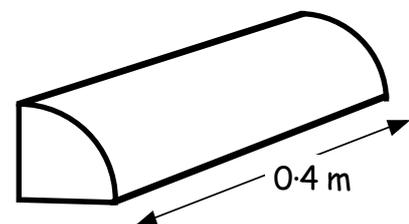


3.



Five people should each pay £16 to hire a football pitch.
If only 4 people turned up, how much would each of them then be expected to pay ?

4. What would be the weight of 12 cakes if 20 cakes weigh 1 kilogram ?
5. The perimeter of a room can be surrounded with fifty 0.4 metre wooden edging strips.
How many strips of edging would be required if each strip was half a metre in length ?



Revision Exercise

1. Look at the picture.
Write down the ratio of :-

- (a) birds to bees.
(b) bees to birds.

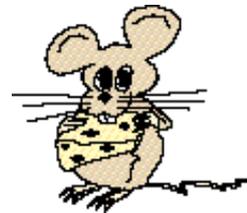


2. Write down each ratio in its simplest form :-

- (a) 4 : 10 (b) 11 : 121 (c) 30 : 18 (d) 108 : 144
(e) 40 : 60 (f) $\frac{1}{2}$: 12 (g) 0.8 : 16 (h) 1.7 : 34.

3. The ratio of mice to rats in a factory is 4 : 5.

- (a) How many mice are there if there are 60 rats ?
(b) How many rats are there if there are 52 mice ?



4. Den and Len share a £40 000 lottery win in the ratio 3 : 5.
How much will each receive ?



5. Share 1000 euros between Ali, Ben and Cari in the ratio 1 : 4 : 5.

6. (a) Eight bottles of juice costs £4. How much would one bottle cost ?
(b) Five DVD's cost £80. How much would it cost for four DVD's ?
(c) If it takes 6 men 5 hours to build a wall, how long would it have taken 4 men ?

7. Five identical videos can hold 800 minutes of playback.
How many minutes of playback could 4 videos hold ?

