Ratios

Write the ratio 20:8 in its simplest form,
the unitary forms n:1 and 1:n

$$= 5:2 \qquad \text{simplest}$$

$$= 2.5:1 \qquad n:1$$

$$= 1:0.4 \qquad 1:n$$

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3. Alan, Bill and Colin share £24 in the ratio 5:3:2. How much does each boy receive?

4. On a school trip, the ratio of teachers to students was 1:6. If there were 140 people altogether on the trip, how many were teachers?

Solutions

Tom receives 5 shares = 5 × £6 = £10

3. £24 represents 5+3+2 = 10 shares

So 1 share = $\frac{£24}{10}$ = £2.40

Alan receives 5 × £2.40 = £12.00
Bill receives 3 × £2.40 = £7.20
Colin receives 2 × £2.40 = £4.80

4. 1 part teachers, 6 parts students

1+6 = 7 parts altogether

7 parts = 140 people

1 part = $\frac{140}{7}$ = 20 people

1 part teachers so 20 teachers

Direct Proportion

3 Betty is paid £34.30 for seven hours' work at a nursing home.
How much should she receive for five hours' work?

4 Six razor blades cost 42p.
How much will ten razor blades cost?

5 A machine makes 490 engine parts in 35 minutes.
How many engine parts will the machine make in one hour?

3) $\dfrac{£34.30}{7}$ for 1 hr

$\qquad\qquad\qquad\qquad\qquad\qquad = £24.50$

$\dfrac{£34.30}{7} \times 5$ for 5 hours

4) $42p \times \dfrac{10}{6}$ $\qquad = 70p$

5) $490 \times \dfrac{60}{35}$ $\qquad = 840$

Inverse Proportion

3 A field of grass provides enough food for 25 cows for eight days. For how long would the same field feed 10 cows?

4 In a school 33 classrooms are required for classes of 32 pupils each.
How many classrooms would be needed if the class size were reduced to 22 pupils?

5 Four bricklayers can build a wall 10 feet high in 10 days. How long would it take five bricklayers to build a similar wall?

3) Feeds 25 cows for 8 days

Feeds 1 cow for $8 \times 25 = 200$ days

Feeds 10 cows for $200 \div 10$ days

$= 20$ days

Or $8 \times \dfrac{25}{10} = 20$ days

4) 33 classrooms $\times \dfrac{32}{22} = 48$ classrooms

5) 10 days $\times \dfrac{4}{5} = 8$ days

6 Two secretaries can type a large document between them in nine hours.
How long would it take three secretaries to type the document?

7 Bags of sugar are packed in seven boxes, each holding 12 bags. If the same quantity of sugar is packed into larger boxes and only six boxes are used, how many bags are there in each box?

8 A quantity of food will last six pigs for 10 days. For how long would the same quantity last four pigs?

6) $9 \text{ hrs} \times \frac{2}{3} = 6 \text{ hrs}$

7) 12 bags each in 7 boxes

$12 \times \frac{7}{6} = 14$ bags per box

8) $10 \text{ days} \times \frac{6}{4} = 15 \text{ days}$

Combining Ratios

On a farm   Cows : Sheep = 4 : 7

Sheep : Pigs = 5 : 3

Find simplest ratio for C : S : P

$$C : S : P$$
$$4 : 7$$

20 : 35   × 5

    5 : 3

  35 : 21   × 7

C : S : P

20 : 35 : 21

Balls in bag

Red : Blue   =   7 : 3

Red : Green   =   2 : 1

Green : Yellow =   2 : 5

Find   R : B : G : Y

R : B : G : Y

7 : 3

14 : 6

28 : 12

2 : 1

14 : 7

28 : 14

2 : 5

14 : 35

Ans   28 : 12 : 14 : 35

Eggs

50g   sugar

2 teaspoons of cornflour

Work out the ingredients required for 2000 ml of custard

_____

10. Ingredients for 4 yorkshire puddings

60 ml   milk

100 ml   water

80g   flour

1 teaspoon   salt

2   eggs

Work out the ingredients for 10 yorkshire puddings

_____

If I have

240 ml milk

Unlimited water

160g   flour

Box salt

12 eggs

$240/60 = 4$ lots

$160/80 = 2$ lots

$12/2 = 6$ lots

How many yorkshire puddings can I make

Flour restricts to $2 \times 4 = 8$ yorkshire puddings