



# MATHEMATICS



**N.S. Yr. 5 P.27**

**Solve problems concerning  
ratio and proportion**

## Equipment

Paper, pencil, squared paper.

# MathSphere

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### **Concepts**

Children should be familiar with the following vocabulary:

*To every, for every, in every, as many as.*

Children should be able to handle problems involving simple ratio and proportion and know that 2 in every 5 means 4 in every 10 etc.

They should be able to describe situations with increasingly complex vocabulary such as:

'Simon has one quarter as many marbles as Fran.'

'In every six packs of cards, there are two with jokers.'

I would like you to write some sentences about a situation. Here is an example. Please read it carefully and make sure you understand it.



**E.g. *Charlie has played one football match for every three matches that Sam has played.***

**We can say:**

Charlie has played one third of the matches that Sam has played.

Sam has played three times as many matches as Charlie.

Charlie has played one quarter of all the matches.

Sam has played three quarters of all the matches.

If Charlie played 6 matches, Sam played 18.

If Sam played 9 matches, Charlie played 3.

1. Jenny has one computer game for every two that Sally has.

Complete these sentences in the same way as in the example:

Jenny has \_\_\_\_\_ of the computer games that Sally has.

Sally has \_\_\_\_\_ as many computer games as Jenny.

Jenny has \_\_\_\_\_ of all their computer games.

Sally has \_\_\_\_\_ of all their computer games.

If Jenny has 4 games, Sally has \_\_\_\_\_.

If Sally has 20 games, Jenny has \_\_\_\_\_.

2. Peter has one CD for every 4 that Gwen has.

Write six sentences about Peter and Gwen in the same way.

3. June is practising her walking and Michael is practising his running.

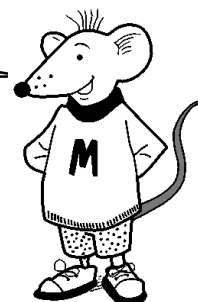
June walks one metre for every three metres that Michael runs.

Write six sentences about June and Michael.

4. At a barbecue, Larry cooks one burger for every two burgers that Chris cooks.

Write six sentences about Larry and Chris.

Here is another example about ratio.  
Please read it carefully and make  
sure you understand it. Then answer  
the questions.



**E.g. Gary and Jessica go shopping. Gary buys one apple  
for every two that Jessica buys.**

**We can say:**

Gary buys one half of the number of apples that Jessica buys.

Jessica buys twice as many apples as Gary buys.

Gary buys one third of all the apples.

Jessica buys two thirds of all the apples.

If Gary buys 4 apples. Jessica buys 8.

If Jessica buys 6 apples, Gary buys 3.

1. A car factory produces red cars and blue cars.  
For every one red car it produces, it also produces three blue cars.

Complete these sentences in the same way as in the example:

There are a \_\_\_\_\_ as many red cars as blue cars.

There are \_\_\_\_\_ times as many blue cars as red cars.

A \_\_\_\_\_ of all the cars are red.

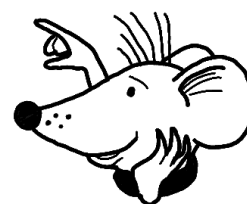
Three \_\_\_\_\_ of all the cars are blue.

If five red cars are made in one hour, \_\_\_\_\_ blue cars are also made.

If twenty-one blue cars are made, \_\_\_\_\_ red cars are made.

2. Mr Jones grows potatoes and carrots in his garden.  
For every potato he grows, he also grows two carrots.  
Write six sentences about Mr Jones' potatoes and carrots in the same way.
3. Cathy has some boxes of wool. For every one green ball of wool there are four balls of yellow wool.  
Write six sentences about the green and yellow balls of wool.
4. A holiday home for animals has one dog for every three cats.  
Write six sentences about the dogs and cats in the same way.

On this page I would like you to complete the sentences.



1. 

There are \_\_\_\_\_ as many white ships as there are black ships.

2. 

For every circle, there are \_\_\_\_\_ squares.

One \_\_\_\_\_ of all the shapes are circles.

\_\_\_\_\_ quarters of all the shapes are \_\_\_\_\_.

3. 

For every cake with four candles, there are \_\_\_\_\_ cakes with three candles.

One \_\_\_\_\_ of all the cakes have four candles.

\_\_\_\_\_ of all the cakes have three candles.

If there were twenty cakes, \_\_\_\_\_ of them would have four candles.

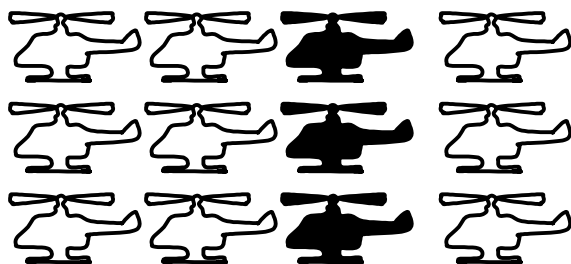
4. 

A \_\_\_\_\_ of all the cats are black.

One in every \_\_\_\_\_ cats is white.

If there were 40 cats altogether, \_\_\_\_\_ would be black.

1.



Can you complete these sentences?

For every black helicopter, there are \_\_\_\_\_ white helicopters.

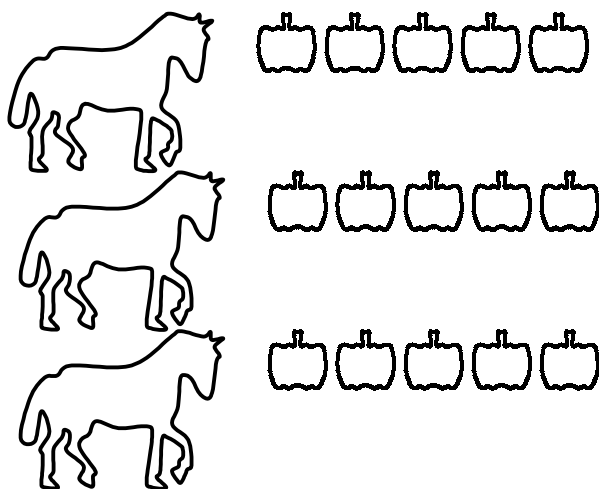
One \_\_\_\_\_ of all the helicopters are black.

\_\_\_\_\_ of all the helicopters are white.

For every two black helicopters there are \_\_\_\_\_ white helicopters.



2.



For every horse, there are \_\_\_\_\_ apples.

There are \_\_\_\_\_ times as many apples as there are horses.

If there were six horses, there would be \_\_\_\_\_ apples.

If there were twenty apples, there would be \_\_\_\_\_ horses.

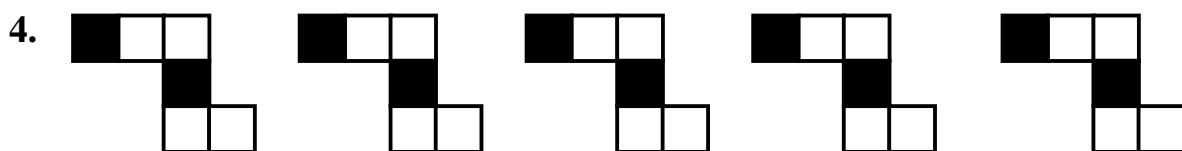
If there were thirty six horses and apples altogether, \_\_\_\_\_ would be horses.



Here are some more  
ratio questions.

Good luck!!!!

1. Michael makes models out of cement. The models takes three hours to harden for every kilogram of cement used.  
How long does a 15 kg model take to set?
2. Tara uses 60 cm of ribbon to decorate two cakes.  
How much ribbon does she need for six cakes?  
How many cakes can she decorate with 240 cm of ribbon?
3. There are 24 pupils in a chess club. There are two boys for every girl.  
How many girls are there?  
How many boys are there?



Sharon makes these shapes from six squares each.

How many coloured squares are there in each pattern?

How many white squares are there in each pattern?

If she drew 20 of the shapes, how many coloured squares would she draw?

5. Danny is painting his house. He needs  $2\frac{1}{2}$  litres of paint for each wall.  
How much paint does he need for six walls?  
How many walls could he paint with  $7\frac{1}{2}$  litres of paint ?

1. Lottie is making strings of beads. She puts three red beads on a string for every four yellow beads.

What do you think, guys?

If she makes a string with thirty red beads, how many yellow beads will she use?

If she uses sixteen yellow beads, how many red beads will she need?

2. I can exchange one pound for three German marks  
How many marks can I get for £10 ?  
How many pounds can I get for 18 marks?

3. At feeding time, an adult cat receives 400 g of food and its kitten receives 150 g.  
How much does **each** cat receive during six meals?  
How much food has the kitten eaten by the time the adult cat has eaten 1 200 g?

4. An architect is designing a housing estate. For every two semi-detached houses, he includes seven terraced houses.  
If there are twenty semi-detached houses in one road, how many terraced houses should there be?  
If there are 91 terraced houses in a road, how many semi-detached houses are there?

5. In a sweet jar there are two red sweets for every three green ones.  
If there are twenty five sweets altogether, how many are red and how many are green?

6. A factory produces large and small mugs. They make three large mugs for every four small ones.  
In one day they make 1 400 mugs altogether. How many are large and how many are small?

Another day they make 330 large mugs. How many small ones do they make?





## Answers

### Page 3

1.

Jenny has **one half** of the computer games that Sally has.

Sally has **twice** as many computer games as Jenny.

Jenny has **one third** of all their computer games.

Sally has **two thirds** of all their computer games.

If Jenny has 4 games, Sally has **eight games**.

If Sally has 20 games, Jenny has **ten games**.

2.

Peter has **one quarter** of the CDs that Gwen has.

Gwen has **four times** as many CDs as Peter.

Peter has **one fifth** of all the CDs.

Gwen has **four fifths** of all the CDs.

If Peter has **n** CDs, Gwen has **4n** (Any suitable numbers, eg. 7, 28).

If Gwen has **m** CDs, Peter has **m/4** (Any suitable numbers, eg. 32, 8).

3.

June walks **one third** of the distance Michael runs.

Michael runs **three times** the distance that June walks.

June walks **one quarter** of the total distance.

Michael runs **three quarters** of the total distance.

If June walks **n** metres, Michael runs **3n** metres.

If Michael runs **m** metres, June walks **m/3** metres.

4.

Larry cooks **half** as many burgers as Chris cooks.

Chris cooks **twice** as many burgers as Larry cooks.

Larry cooks **one third** of all the burgers.

Chris cooks **two thirds** of all the burgers.

If Larry cooks **n** burgers, Chris cooks **2n** burgers.

If Chris cooks **m** burgers, Larry cooks **m/2** burgers.

Answers (Contd)**Page 4****1.**There are a **third** as many red cars as blue carsThere are **three** times as many blue cars as red cars.A **quarter** of all the cars are red.Three **quarters** of all the cars are blue.If five red cars are made in one hour, **fifteen** blue cars are also made.If twenty-one blue cars are made, **seven** red cars are made.**2.**Mr Jones grows **one half** as many potatoes as carrots.Mr Jones grows **twice** as many carrots as potatoes.**One third** of the vegetables are potatoes.**Two thirds** of the vegetables are carrots.If Mr Jones grows **n** potatoes, he grows **2n** carrots. (Any suitable numbers, eg. 7, 14).If Mr Jones grows **m** potatoes, he grows **m/2** carrots. (Any suitable numbers, eg. 20, 10).**3.**There are **one fifth** as many green balls as there are yellow balls.There are **four times** as many yellow balls as there are green balls.**One fifth** of all the woollen balls are green.**Four fifths** of all the woollen balls are yellow.If **n** of the balls are green, **4n** are yellow. (Any suitable numbers, eg. 4, 16).If **m** of the balls are yellow, **m/4** are green. (Any suitable numbers, eg. 24, 6).**4.**There are **one third** as many dogs as there are cats.There are **three times** as many cats as there are dogs.**One quarter** of all the animals are dogs.**Three quarters** of all the animals are cats.If there are **n** dogs, there are **3n** cats. (Any suitable numbers, eg. 5, 15).If there are **m** cats, there are **m/3** dogs. (Any suitable numbers, eg. 24, 8).**Page 5****1.** twice**2.** three

quarter

three quarters ..... squares

**3.** 4, one fifth, four fifths, four**4.** half, two, twenty

**Answers (Contd)****Page 6**

1. three, quarter, three quarters, six
2. five, five, thirty, four, six

**Page 7**

1. 45 hours
2. 180 cm, 8 cakes
3. 8 girls, 16 boys
4. two, four, forty
5. 15 litres, three.

**Page 8**

1. forty, twelve
2. 30 marks, £6
3. Cat 2 400 g, kitten 900 g, 450 g
4. 70, 26
5. 10 red, 15 green
6. 600 large, 800 small
7. 440 small