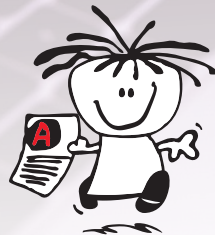


MATHS LITERACY TEACHER SUPPORT WORKSHOP

BASIC SKILLS - Tips & Tricks

**CLASSROOM
RESOURCES**



THE
ANSWER
SERIES *Your Key to Exam Success*

EXAM PAPER FORMAT SUMMARY

PAPER 1		PAPER 2	
Topics & Weighting	Question Details	Topics & Weighting	Question Details
Finance 60% = 90/150 marks	Q1: Finance & Data handling * 30 marks + 5 marks ONLY Level 1 questions * Short context - mixed questions * Familiar context	Maps, Plans & Representations 40% = 60/150 marks	Q1: Maps & Measurement * 30 marks + 5 marks ONLY Level 1 questions * Short context - mixed questions * Familiar context
Data Handling * 35% = 53/150 marks * Growth charts (typically in P2 – Measurement) can be assessed re application of measures of spread	Q2: Finance * Familiar context	Measurement * 55% = 83/150 marks * Income, expenditure, profit/loss, I&E statements & budgets, cost price & selling price (P1 – Finance) assessed	Q2: Maps * Familiar context
Probability 5% = 7/150 marks	Q3: Data Handling * Familiar context	Probability 5% = 7/150 marks	Q3: Measurement * Familiar context
Numbers and Calculations with Numbers Integrated throughout	Q4/5: Finance & Data Handling * Integrated, unfamiliar context	Numbers and Calculations with Numbers Integrated throughout	Q4/5: Maps & Measurement * Integrated, unfamiliar context
Patterns, Relationships and Representations Integrated throughout	** Probability assessed throughout Q1-Q5	Patterns, Relationships and Representations Integrated throughout	** Probability assessed throughout Q1-Q5

FOCUS AREAS BY TOPIC

Finance

- VAT (reverse calculations)
- Income tax tables (tax rebates)
- Exchange rates (multiple exchanges)
- Interest (different interest rates per year)
- Cost price & selling price
- Conversions between rands and cents
- Rounding to 2 decimal places



Measurement

- Conversions (area conversions)
- Time (calculating elapsed time)
- Concept of spread rate
- Exposure to irregular shapes
- **Dimensions (depth & different units)**

Probability

- NOT events



Maps, Plans & Representations

- Compass direction (when North is pointing at an angle)
- Scale calculations
- Assembly diagrams
- Packaging problems

Data Handling

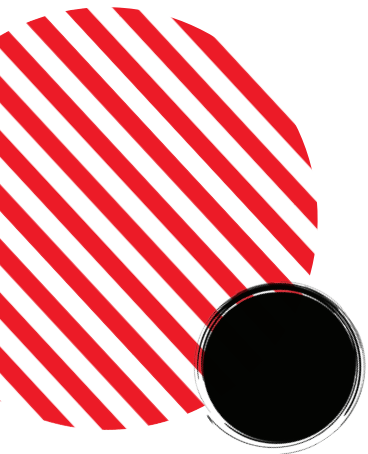
- Box-and-whisker plots (multiple sets of data)
- Range & IQR (multiple sets of data)





FOCUS AREAS BY SKILLS

Basic Skills

- Large numbers
- Rounding off, up, down and to the nearest
- Percentages (incl. $> 100\%$)
- Ratios (emphasis on order)
- Substitution into formulae
- Reverse calculations



Language Skills

- Using English across the curriculum – speaking, reading & writing
 - Defining concepts or terms
 - Extracting information from tables, graphs and context
 - Answering questions that require reasoning
 - Making concluding statements (accompanied by calculations)
- 
- 

Baseline Assessment – Finance

BASELINE ASSESSMENT

Thando is able to harvest 15 potatoes, 7 carrots and 2 pumpkins from her own garden each week.

1. What percentage of her garden produces carrots?
(Round off to 2 decimal places)
2. Determine how many potatoes Thando could harvest per week if her crop produced 20% more?
3. Thando sold her pumpkins to a local shop for R14 per kilogram. Calculate how much she earned if her pumpkins weighed 3,7 kg.
(Round off to the nearest rand)

%
**Rounding
&
Rate Baseline
Assessment!**



Answers

BASELINE ASSESSMENT

1. Total harvest = $15 + 7 + 2 = 24$

% Carrots = $\frac{7}{24} \times 100\%$ % = fraction of a whole

= 29,166667%

$\approx 29,17\%$ round off to 2 d.p.

2. Increase = $\frac{20}{100} \times 15$ increase = % \times total

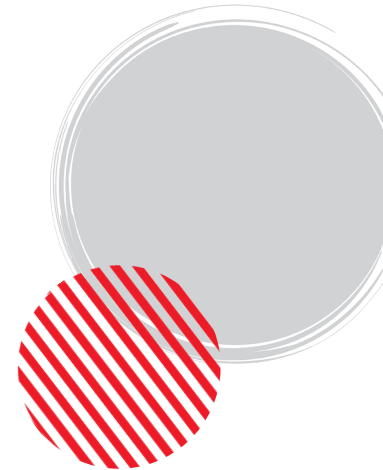
= 3 potatoes

Potato harvest = $20 + 3 = 23$ potatoes total = original + increase

3. Earnings = $R14,50 \times 3,7$ kg earning = rate \times weight

= R53,65

$\approx R54$ round off to nearest rand



Class Exercise

TERMINOLOGY

Form PAIRS and WITHOUT your book, explain the meaning of ...

1. Give the general formula for *Selling price* = ...
2. What do you call it when the income > the expenses?
3. Define the term *cost price*.
4. How would you calculate the % profit of an item?



COST PRICE AND SELLING PRICE

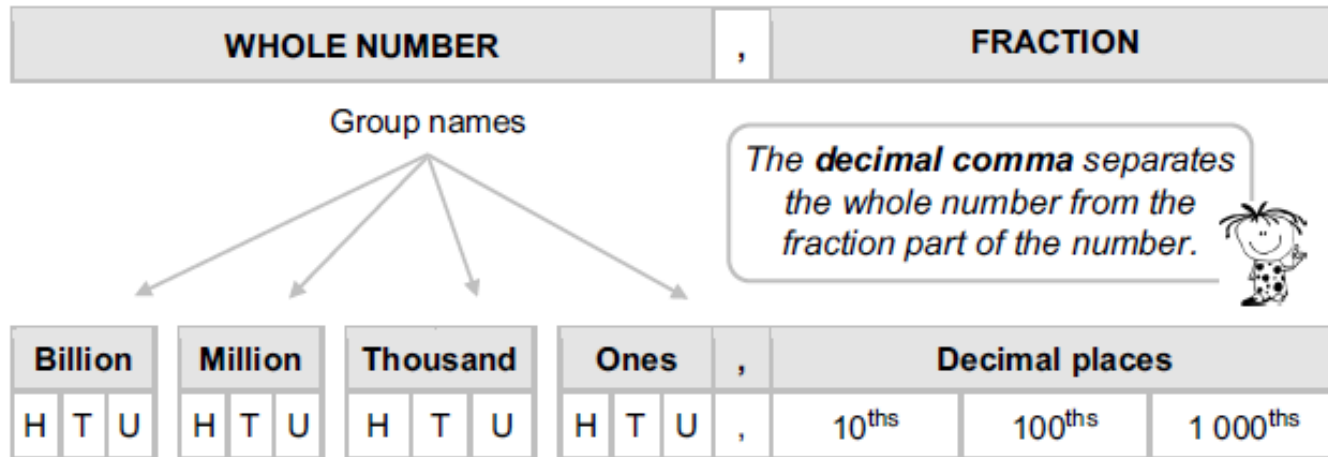
cost price	the cost of manufacturing or buying a product; and is determined by production costs and operating costs i.e. $\text{cost price} = \text{selling price} - \text{profit}$
selling price	the price at which the product is sold; and is determined by factors such as cost price, profit etc. i.e. $\text{selling price} = \text{cost price} + \text{profit}$
profit	when the income is bigger than the expenses; which results in a surplus/excess of money i.e. $\text{income} > \text{expenses} \therefore \text{profit} = \text{income} - \text{expenses}$ when the selling price of an item/service is more than the cost price of an item/service; which results in a surplus/excess of money i.e. $\text{selling price} > \text{cost price} \therefore \text{profit} = \text{selling price} - \text{cost price}$
% profit	a percentage calculated which compares the relationship between the profit and cost price i.e. $\% \text{ profit} = \frac{\text{profit}}{\text{cost price}} \times 100\%$
profit margin	a measure of the profitability of a business; and a means of comparing business performance over different time intervals i.e. $\text{profit margin} = \frac{\text{profit}}{\text{income}} \times 100\%$

5. LARGE NUMBERS

Working with numbers as digits and words



Numbers are grouped in threes from right to left starting at the comma. Each group of three digits has a name, i.e. **Ones**, **Thousand**, **Million**, **Billion**, and is made up of **Hundreds**, **Tens** and **Units**. (HTU respectively)



Terminology!

NUMBER FORMATS & CONVENTIONS

digit	any of the digits from 0 – 9 that are written together to form a larger number e.g. the number 79 is made of the digits 7 and 9
million	a thousand thousands i.e. 1 000 000 (6 zeros)
billion	a thousand million i.e. 1 000 000 000 (9 zeros)
trillion	a million million i.e. 1 000 000 000 000 (12 zeros)

LARGE NUMBERS

2. The midyear estimated total population of South Africa for 2015 was 54 957 764. Which ONE of the following represents the estimated 2015 midyear total population?

- A Fifty-four million, nine hundred and seventy-five thousand, seven hundred and sixty-four
- B Fifty-four million, nine hundred and fifty-seven thousand, seven hundred and sixty-four
- C Fifty-four million, nine hundred and fifty-seven thousand, seven hundred and forty-six

Gr. 12ML – Feb/Mar 2017 – P1 – Q4.3.1

Answer

- B Fifty-four million, nine hundred and fifty-seven thousand, seven hundred and sixty-four



Million			Thousand			Ones		
H	T	U	H	T	U	H	T	U
0	5	4	9	5	7	7	6	4

Class Worked Example

Worked Examples



1. How many 2 l tins of paint does Paula need if she is painting three walls and each wall requires 1,5 l of paint?

$$\text{Number of litres of paint} = 1,5 \text{ l} \times 3 = 4,5 \text{ l}$$

∴ Paula needs 3 tins of paint.

(i.e. $2 \text{ l} \times 3 = 6 \text{ l}$ of paint but $2 \text{ l} \times 2 = 4 \text{ l}$ would not be enough!)

2. Mary runs a lift club and decides that each member should pay R180,00 each month. How many people does she need in the lift club if she needs R1 200 per month?

She needs $R1\ 200,00 \div R180,00$, which is 6,6666... people.

She would therefore have to have 7 people in the lift club to cover the costs.

(She will collect a little more than the R1 200,00 she needed.)

*If she rounded down to 6, she would only collect
 $6 \times R180 = R1\ 080$; which isn't enough!*



ROUNDING OFF

**Make sense
of your answer
IN CONTEXT!**



Class Exercise

Jenny owns a bakery and received an order to make a big, round wedding cake that has a diameter of 30 cm and a height of 17 cm. Will Jenny be able to use her large stand mixing bowl that has a maximum volume of 12 017 cm³?

You may use the following formula:

Volume of a round cake = $\pi \times (\text{radius})^2 \times \text{height}$; where $\pi = 3,142$



Answer

ROUNDING OFF

$$\begin{aligned}\text{Volume of a round cake} &= \pi \times (\text{radius})^2 \times \text{height} \\ &= 3,142 \times (15)^2 \times 17 \\ &= 12\,018,15 \text{ cm}^3\end{aligned}$$

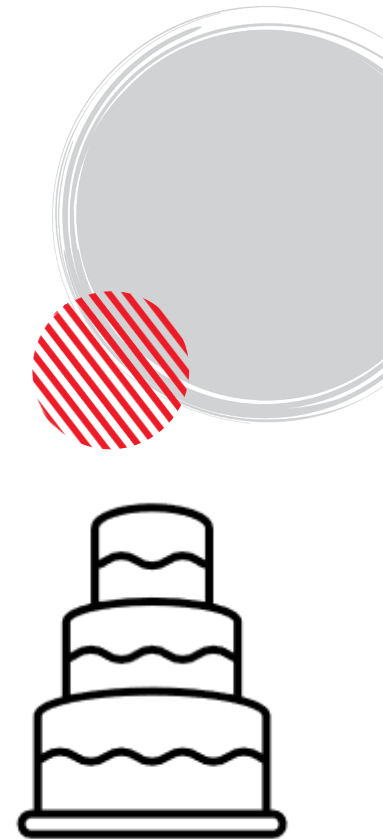
∴ Jenny would NOT be able to use her mixing stand

[Remember! Mixing bowl has a maximum volume = 12 017 cm³]

Beware ... the incorrect answer!

$$\text{Volume of a round cake} = \pi \times (15)^2 \times 17 = 12\,016,59 \text{ cm}^3$$

∴ Jenny WOULD be able to use her mixing stand



Class Exercise

TABLES

4. Each year South Africa generates income from exports (products sold to other countries). The income generated from these exports varies from year to year. Part of the income generated by exports comes from agricultural products.

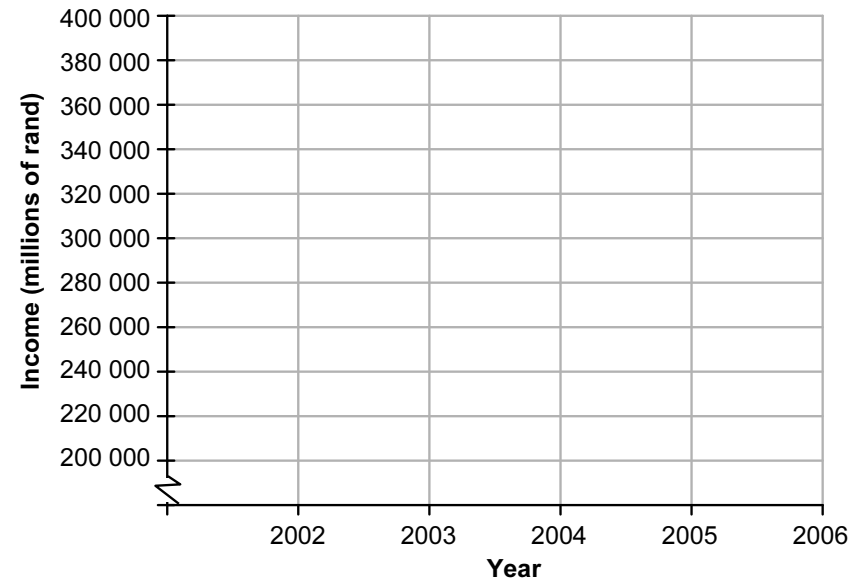
The table below shows the total income from exports, as well as the percentages of the total earned from agricultural products.

RELATIONSHIP BETWEEN SOUTH AFRICAN EXPORTS OF AGRICULTURAL AND OTHER PRODUCTS

Year	Total income generated by South African exports (in millions of rand)	Income generated by agricultural exports (in millions of rand)	Percentage of the total income earned by agricultural products
2002	314 927	25 460	8,1
2003	273 127	22 670	8,3
2004	292 079	22 074	
2005	326 385	25 458	7,8
2006	393 047	26 978	6,9

- 4.1 Calculate the total income generated by agricultural exports from 2002 to the end of 2006.
- 4.2 What percentage of the total income earned by South African exports in 2004 was by agricultural products?
- 4.3 Draw a line graph of the total income generated by South African exports, using the system of axes below:

INCOME GENERATED BY TOTAL SOUTH AFRICAN EXPORTS



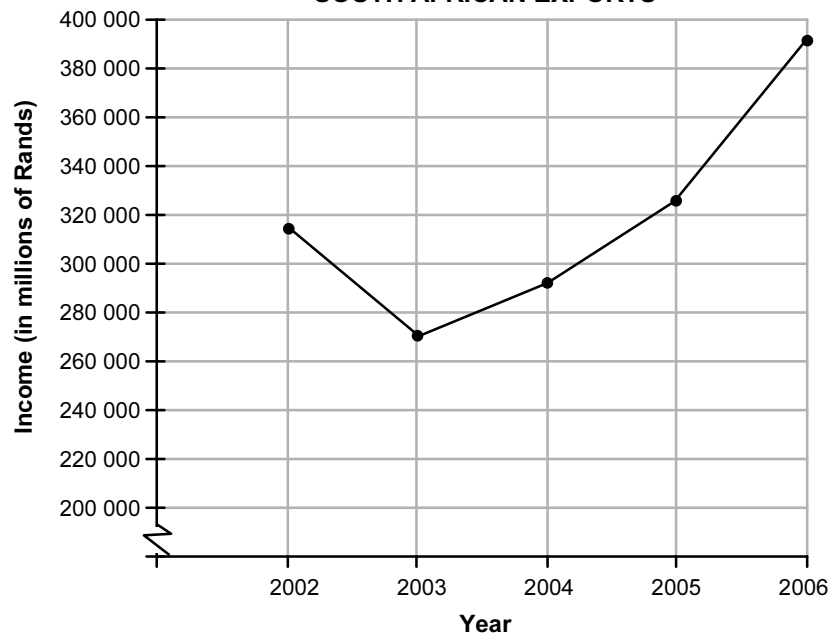
Answers

4.1 Total income generated by agricultural exports
= 25 460 + 22 670 + 22 074 + 25 458 + 26 978
= R122 640 million

4.2 $\% = \frac{22\,074}{292\,079} \times 100\% = 7,56\%$

4.3

INCOME GENERATED BY TOTAL SOUTH AFRICAN EXPORTS



Mathematical Literacy

CLASS TEXT & STUDY GUIDE

Susan Nicol, et al.

TABLES









3-in-1

THE ANSWER SERIES Your Key to Exam Success

8. GRAPHS

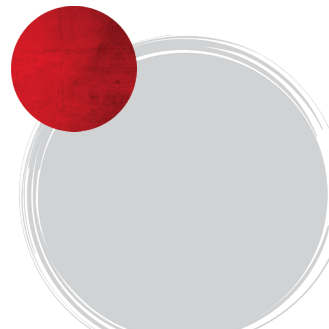
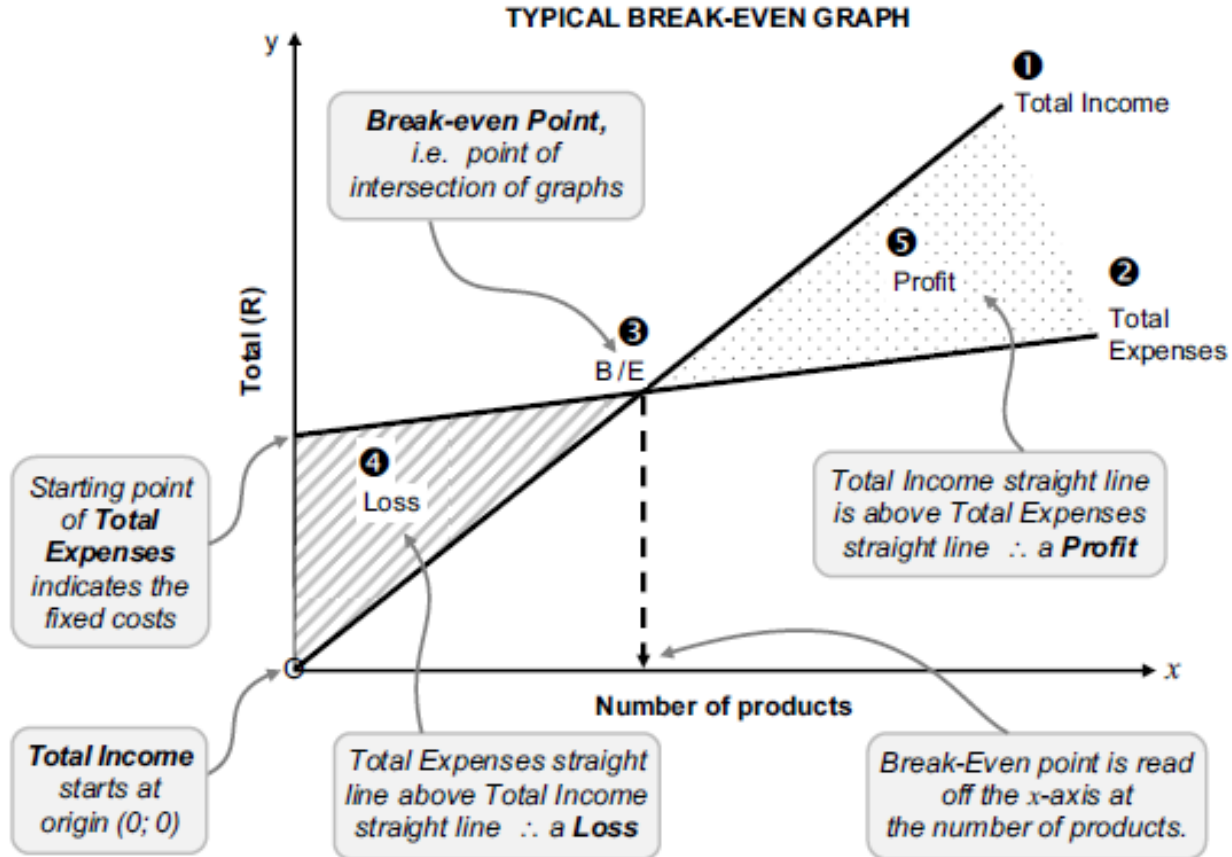
Think **RUNNER!**

Key aspects to understanding a graph:

	Head ...	What is he thinking?	
	Arms ...	What are the 2 variables?	
	Legs ...	Where is he running?	
	Ready, set, go! ...	Where is the starting line?	

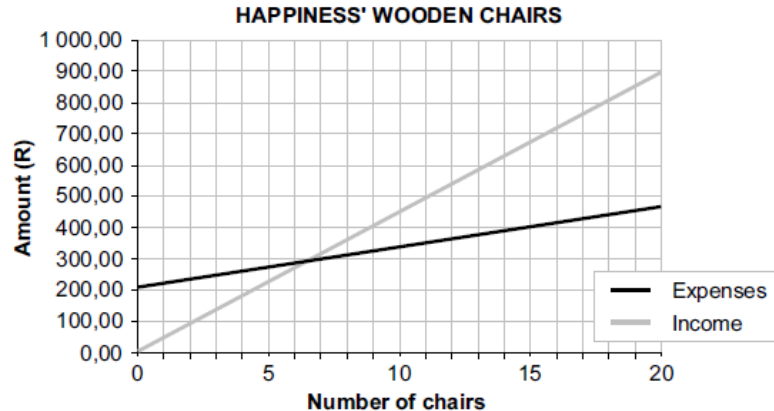
2 Break-even Graphs

GRAPHS



Exercise

2. Happiness makes wooden chairs for a living. The graph below shows his income and expenses for a month.



- 2.1 Use the graphs to answer the following questions.
- 2.1.1 Estimate how much Happiness pays in fixed expenses.
- 2.1.2 Give TWO examples of fixed expenses that Happiness might have.
- 2.2 How much does Happiness sell his chairs for?
- 2.3 How many chairs does Happiness need to sell in order to break even?
- 2.4 How much income will Happiness receive if he sells 12 chairs?
- 2.5 How much profit will Happiness make if he sells 15 chairs?
- 2.6 Which graph(s) would be affected if Happiness increased the selling price of his chair? Explain your choice.

Answers

- 2.1.1 \approx R205
- 2.1.2 Rent, salaries/wages, loan repayments, vehicle repayments, insurance, etc.
- 2.2 Reading from the graph :
2 chairs cost R100,00
 \rightarrow 1 chair costs $R100,00 \div 2 = R50,00$
- 2.3 According to the graph, the break-even point (the point where the graphs intersect) is $6\frac{1}{2}$ chairs. This means that Happiness must sell more than 6 chairs – i.e. 7 chairs – in order to break even.
- 2.4 Income from 12 chairs \approx R540,00
- 2.5 Profit from selling 15 chairs = income - expenses
 \approx R680,00 - R400,00
 \approx R280,00
- 2.6 The Income graph would be affected and would become steeper because his income per chair would be more. The Expenses graph would not be affected as the only thing that is increasing is the selling price (and hence the income).

GRAPHS

Simplifying ratios

- **1** whole number
e.g. 24 : 16
.....
- **2** decimal
e.g. 2,5 : 15
.....
.....
- **3** fraction
e.g. $\frac{2}{3} : \frac{1}{4}$
.....
.....
.....
- **4** different units
e.g. 10 cm : 12 m
.....
.....
.....
- **5** unit form (1 :)
e.g. 8 : 48
.....

Definition

-
- Order is NB!
e.g. 1 : 4 = vs
..... = $\frac{4}{1}$



Equivalent ratios

-
- \times or \div both values by HCF
- e.g.
.....
.....

Missing value ratios

- Given ratio of 2 quantities
- Given value of 1 quantity
- \times or \div by HCF
- e.g. ratio of red to blue smarties in a box is 3 : 5. If there 12 red smarties, how many blue smarties?
Red : blue
.....
.....

Sharing & dividing in a ratio

- Given ratio of 2 quantities
- Given sum/total of quantities
- Share sum/total using ratios
- e.g. ratio of red to blue smarties in a box is 3 : 5. If there are 24 smarties in box, how many blue ones?
Red : Blue
.....
.....
.....