Foundation

Maths GCSE Problem Solving Questions Workbook

Fractions of amounts

GRADES 1 – 4

MATHS-SCHOOL

Fractions of amounts

EXAMPLE

Terry makes 18 bags of sweets.
He sells half of the bags at his school fair.
He sells one-third of the bags he has left to his friends.
How many of the bags has he not sold?

18 × ½ = 9 (bags sold at fair)

18 – 9 = 9 (bags left)

9 × 1/3 = 3 (bags sold to his friends)

9 – 3 = 6 (Final number of bags left)

He has not sold 6 bags

1 June has 32 bags of crisps.
She sells a quarter of the bags at her school fair.
She sells a half of the bags she has left to her friends.

How many of the bags has she sold?

2 Terry makes 60 bags of sweets.
He sells $\frac{5}{6}$ of the bags at his school fair.
He sells $\frac{3}{5}$ of the bags he has left to his friends.

How many of the bags has he not sold?

3 Ronnie and Robbie own some land.
Ronnie sells $\frac{4}{9}$ of his land and is left with 80 hectares
Robbie sells $\frac{3}{5}$ of his land and is left with 44 hectares.
Who sold the most land (you must show your working)?

Fractions of amounts

EXAMPLE

A small bottle holds $\frac{2}{5}$ of a litre of juice

Small bottles are filled from large containers that hold 5 litres of juice.

How many small bottles can be completely filled from three large containers?

3 large containers $= 3 \times 5$ litres $= 15$ litres

$$15 \div \frac{2}{5} = 15 \times \frac{5}{2} = \frac{15}{1} \times \frac{5}{2} = \frac{75}{2} = 37.5$$

Therefore 37 can be completely filled

1 A large water bottle holds 7/8 of a litre

Large water bottles are filled from buckets that hold 10 litres.

How many large water bottles can be filled with 6 large containers?

2 A small bottle holds 4/7 of a litre of juice

Small bottles are filled from large containers that hold 6 litres of juice.

How many small bottles can be filled from five large containers?

3 A barrel holds 160 litres of petrol

Geoff is told that his car petrol tank holds $\frac{2}{5}$ of a barrel.

a) How many litres does his car petrol tank hold?

b) If Geoff buys 4 barrels how many full tanks will that give him?

c) Geoff's motorbike only holds one quarter of the amount that Geoff's car does.
What fraction of a barrel does the motorbike hold?

Fractions of amounts

EXAMPLE

Matt, Mark, Luke and John share £240 between them.
Matt has £55 of the money, Mark has £35, Luke has $\frac{3}{8}$ of the money,
What fraction of the money does John have?
Give your answer in its simplest form

$240 - 35 - 55 = 150$ **(money for Luke and John)**

$240 \times \frac{3}{8} = 90$ **(Luke's money)**

$150 - 90 = 60$ **(John's money)**

Fraction of money is : $\frac{60}{240} = \frac{6}{24} = \frac{3}{12} = \frac{1}{4}$

1 Matt, Mark, Luke and John share £85 between them.
Matt has £21 of the money, Mark has £7, Luke has $\frac{7}{12}$ of the money,
What fraction of the money does John have?

2 Sue, Rita and Bob share £300 between them.
Rita gets £40 of the money, Bob get $\frac{2}{5}$,
What fraction of the money does Sue **not** get?
Give your answer in its simplest form

3 A car decreases in value by £3,500 from its original price of £18,000
What fraction of the original price is the car now worth?
(Leave your answer in its simplest form)

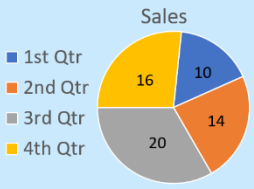
4 In a class of 30 students, $\frac{1}{5}$ of them say they like Maths most, $\frac{1}{10}$ of them say PE and $\frac{1}{6}$ say Science.
If half of the remaining students like English most, what fraction of the class like English most?
(Leave your answer in its simplest form)

Fractions of amounts

EXAMPLE

The chart shows the number of sales for ABC Ltd in 2019

a) What fraction of sales were in the 4th Qtr? Give your answer in its simplest form



Total sales $= 16 + 10 + 14 + 20 = 60$

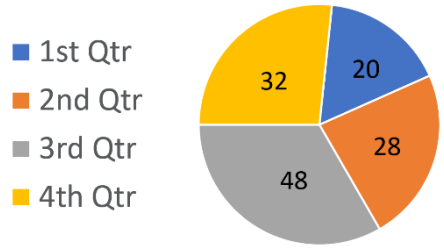
Fraction in the 4th quarter $= \frac{16}{60} = \frac{8}{30} = \frac{4}{15}$

b) Which quarter represents exactly $\frac{1}{3}$ of the sales?

b) $60 \times \frac{1}{3} = 20$ **3rd quarter** $= 20$

1 The chart shows the number of sales for DEF Ltd in 2019

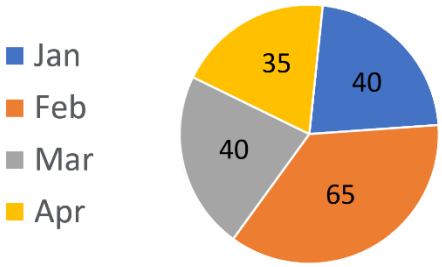
a) What fraction of sales were in the 2nd quarter? Give your answer in its simplest form



b) Which quarter represents exactly $\frac{3}{8}$ of the sales?

2 The chart shows the number of sales for XYZ Ltd in 2015

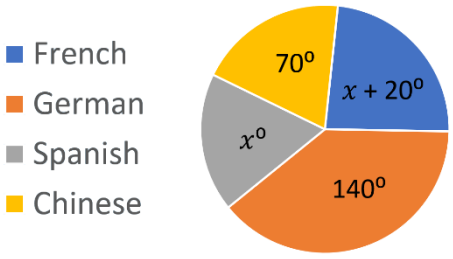
a) What fraction of sales were in January? Give your answer in its simplest form



b) Which two months combined represented exactly 4/9 of the sales?

3 The pie chart represents the number students studying a language at a University

a) What fraction of the students study German?



b) What fraction study Spanish? Give your answer in its simplest form

Solutions

Page 1 – Fraction of amounts

1. 20: $32 \times \frac{1}{4} = 8$ (bags sold at fair)

$32 - 8 = 24$ (bags left)

$24 \times \frac{1}{2} = 12$ (bags sold to her friends)

$8 + 12 = 20$ (number of bags sold)

2. 4 bags : $60 \times \frac{5}{6} = 50$ (bags sold at fair)

$60 - 50 = 10$ (bags left)

$10 \times \frac{3}{5} = 6$ (bags sold to his friends)

$10 - 6 = 4$ (number of bags left)

3. Robbie :

80 hectares $= \frac{5}{9}$, $80 \div 5 = 16$ hectares $= \frac{1}{9}$

$16 \times 4 = 64$ (land Ronnie Sold)

44 hectares $= \frac{2}{5}$, $44 \div 2 = 22$ hectares $= \frac{1}{5}$

$22 \times 3 = 66$ (land Robbie Sold)

Page 2 – Fractions of amounts

1. $68 : 6 \times 10$ litres $= 60$ litres (containers)

$60 \div \frac{7}{8} = 60 \times \frac{8}{7} = \frac{60}{1} \times \frac{8}{7} = \frac{480}{7} = 68.57 \ldots$

2. $52 : 5 \times 6$ litres $= 30$ litres (containers)

$30 \div \frac{4}{7} = 30 \times \frac{7}{4} = \frac{30}{1} \times \frac{7}{4} = \frac{210}{4} = 52.5$

3. **a**) $64 : 160 \div 5 \times 2$

b) $10: 4 \times 160 = 640$ litres , $640 \div 64 = 10$

c) $\frac{1}{10} : \frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$ or $\frac{64}{4} = 16 \rightarrow \frac{16}{160} = \frac{1}{10}$

Page 3 – Fractions of amounts

1. $\frac{7}{85} : 84 - 21 - 7 = 56$ (money for Matt & Mark)

$84 \times \frac{7}{12} = 49$ (Luke's money)

$56 - 49 = 7$ (John's money)

2. $\frac{8}{15} : 300 \times \frac{2}{5} = 120$ (Money for Bob)

$120 + 40 = 160$ (Money Sue does not get)

Fraction of money is: $\frac{160}{300} = \frac{16}{30}$

3. $\frac{29}{36}$: New value $= £18{,}000 - £3{,}500 = £14{,}500$

Fraction $= \frac{\text{new value}}{\text{original value}} = \frac{14500}{18000} = \frac{145}{180} = \frac{29}{36}$

4. $\frac{4}{15} : \frac{1}{5} = 6$, $\frac{1}{10} = 3, \frac{1}{6} = 5 \rightarrow 30 - 6 - 3 - 5 = 16$

$$16 \div 2 = 8 \rightarrow \frac{8}{30} = \frac{4}{15}$$

Page 4 – Fractions of amounts

1. **a**) $\frac{7}{32}$: Total sales $= 32 + 20 + 28 + 48 = 60$

Fraction in the 2nd quarter $= \frac{28}{128} = \frac{14}{64} = \frac{7}{32}$

b) 3rd quarter: $128 \times \frac{3}{8} = 48$

2. **a**) $\frac{2}{9}$: Sales $= 40 + 40 + 35 + 65 = 180$

Fraction in Jan $= \frac{40}{180} = \frac{4}{18} = \frac{2}{9}$

b) Jan & Mar : $180 \times \frac{4}{9} = 80$

3. **a**) $\frac{7}{18} : \frac{140}{360} = \frac{14}{36} = \frac{7}{18}$

b) $\frac{13}{72} : x + x + 20 + 70 + 140 = 360$

$2x + 230 = 360 \rightarrow 2x = 130 \rightarrow x = 65$

Fraction studying Spanish $= \frac{65}{360} = \frac{13}{72}$