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Name: _____ Class: _____ Date: _____

PRIMARY 6 · FOUNDATION MATHEMATICS · FRACTIONS

Fractions: Fraction and Division

Theory and worked examples

What You Already Know

In Primary 5 you learnt these fraction skills. You will use them in every part of this chapter, so check that you can still do each one.

Skill	Example
Simplest form: divide the numerator and the denominator by the same number	$\frac{6}{8} = \frac{3}{4}$ $(\div 2)$
Improper fraction to mixed number: divide the numerator by the denominator	$\frac{7}{3} = 2\frac{1}{3}$ $(7 \div 3 = 2$ remainder $1)$
Mixed number to improper fraction	$1\frac{2}{5} = \frac{7}{5}$ $(1 \times 5 + 2 = 7)$
Fraction × whole number	$\frac{2}{3} \times 6 = \frac{12}{3} = 4$
Fraction × fraction: numerator × numerator, denominator × denominator	$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$

WORKED EXAMPLE

Find $\frac{3}{4} \times \frac{2}{9}$. Give your answer in its simplest form.

1. Multiply the numerators: $3 \times 2 = 6$
2. Multiply the denominators: $4 \times 9 = 36$
3. $\frac{3}{4} \times \frac{2}{9} = \frac{6}{36}$
4. Divide the numerator and the denominator by 6: $\frac{6}{36} = \frac{1}{6}$

$\frac{1}{6}$

TRY THIS

Write $\frac{14}{4}$ as a mixed number in its simplest form.

Answer: $3\frac{1}{2}$

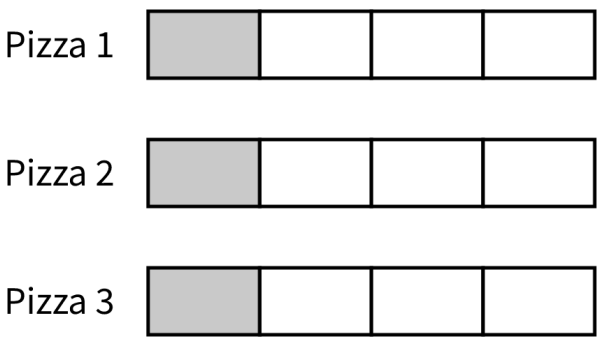
Division Gives a Fraction

When we share a whole number equally, the answer can be a fraction. $1 \div 4$ means 1 whole cut into 4 equal parts, so each part is $\frac{1}{4}$. In the same way, $3 \div 4$ means 3 wholes shared equally among 4. The picture shows 3 pizzas, each cut into 4 equal pieces. One person's share is shaded: 1 piece from each pizza, which is 3 quarters.

KEY IDEA

Whole number ÷ whole number = a fraction. The first number is the numerator and the second number is the denominator: $3 \div 4 = \frac{3}{4}$.

- $2 \div 5 = \frac{2}{5}$
- $1 \div 6 = \frac{1}{6}$
- $6 \div 8 = \frac{6}{8} = \frac{3}{4}$ (always give the simplest form)



WORKED EXAMPLE

4 friends share 3 pizzas equally. What fraction of a pizza does each friend get?

1. Cut each pizza into 4 equal pieces. Each piece is $\frac{1}{4}$ of a pizza.
2. Each friend gets 1 piece from each of the 3 pizzas: 3 pieces of $\frac{1}{4}$.
3. So each friend gets $3 \div 4 = \frac{3}{4}$ of a pizza.

$\frac{3}{4}$ of a pizza

TRY THIS

Write 5 ÷ 9 as a fraction.

Answer: $\frac{5}{9}$

When the Answer Is More Than 1

If the first number is bigger than the second number, the answer is more than 1. You get an improper fraction first. Then change it to a mixed number and give it in its simplest form.

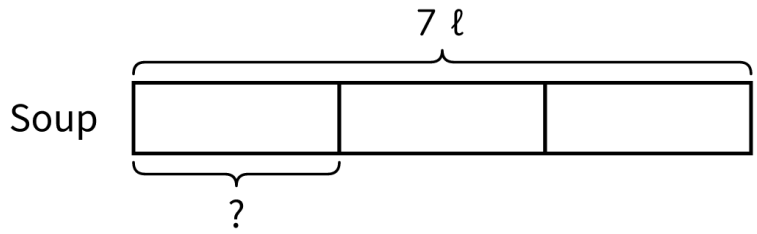
KEY IDEA

Remainder ÷ divisor gives the fraction part: 9 ÷ 4 = 2 remainder 1, so $9 \div 4 = 2\frac{1}{4}$.

- $9 \div 4 = \frac{9}{4} = 2\frac{1}{4}$ (9 ÷ 4 = 2 remainder 1)
- $10 \div 4 = \frac{10}{4} = 2\frac{2}{4} = 2\frac{1}{2}$
- $12 \div 4 = 3$ (no remainder, so the answer is a whole number)

WORKED EXAMPLE

Mrs Lim poured 7 ℓ of soup equally into 3 pots. How much soup was in each pot?



1. 3 units = 7 ℓ
2. 1 unit = $7 \div 3 = \frac{7}{3}$ ℓ
3. $\frac{7}{3} = 2\frac{1}{3}$ (7 ÷ 3 = 2 remainder 1)

$2\frac{1}{3}$ ℓ

TRY THIS

A 9 m rope is cut into 6 equal pieces. How long is each piece? Give your answer as a mixed number in its simplest form.

Answer: $1\frac{1}{2}$ m

Changing Fractions to Decimals

A fraction is a division: $\frac{3}{8}$ means 3 ÷ 8. So to change a fraction to a decimal, divide the numerator by the denominator. If you can make the denominator 10, 100 or 1000, you can write the decimal straight away.

- Way 1 (denominator 10, 100 or 1000): $\frac{3}{5} = \frac{6}{10} = 0.6$ $\frac{7}{25} = \frac{28}{100} = 0.28$
- Way 2 (divide): $\frac{3}{8} = 3 \div 8 = 0.375$
- Mixed number: keep the whole number in front. $2\frac{1}{4} = 2 + 0.25 = 2.25$
- Whole number ÷ whole number as a decimal: $7 \div 4 = \frac{7}{4} = 1\frac{3}{4} = 1.75$
- Changing ℓ to ml: 1 ℓ = 1000 ml, so 0.6 ℓ = 0.6 × 1000 ml = 600 ml.

Fraction	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{5}$	$\frac{1}{8}$	$\frac{1}{10}$
Decimal	0.5	0.25	0.75	0.2	0.125	0.1

WORKED EXAMPLE

Express $\frac{5}{8}$ as a decimal.

1. $\frac{5}{8} = 5 \div 8$
2. 8 cannot go into 5, so write 5 as 5.000 and divide.
3. 50 tenths ÷ 8 = 6 tenths, remainder 2 tenths
4. 20 hundredths ÷ 8 = 2 hundredths, remainder 4 hundredths
5. 40 thousandths ÷ 8 = 5 thousandths, no remainder
6. So 5 ÷ 8 = 0.625

0.625

TRY THIS

Express $\frac{7}{20}$ as a decimal.

Answer: 0.35

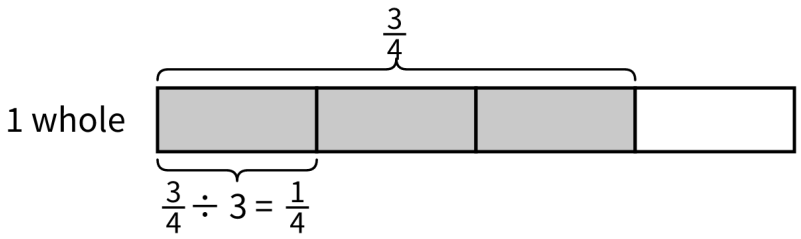
Dividing a Fraction by a Whole Number

$\frac{3}{4} \div 3$ means: share $\frac{3}{4}$ into 3 equal parts. In the bar below, $\frac{3}{4}$ is shaded. Cut it into 3 equal parts and each part is $\frac{1}{4}$. Sharing into 3 equal parts is the same as finding $\frac{1}{3}$ of it, so ÷ 3 is the same as × $\frac{1}{3}$.

KEY IDEA

Fraction ÷ whole number: change ÷ to × and write the whole number as a fraction with 1 on top.

- Example: $\frac{3}{4} \div 3 = \frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$
- $\frac{2}{5} \div 3 = \frac{2}{5} \times \frac{1}{3} = \frac{2}{15}$
- Quick check: if the numerator can be divided exactly by the whole number, just divide the numerator. $\frac{6}{11} \div 2 = \frac{3}{11}$
- The answer is always smaller than the fraction you started with.



CHAPTER 1

Practice Questions

Part 2: Fractions: Fraction and Division



In the practice questions

25 questions, 52 marks. Show your working in the space given and write your answer on the answer line. The answers are on page 235.

- Section A: Multiple Choice: 10 questions, 15 marks
- Section B: Short Answer: 10 questions, 20 marks
- Section C: Structured Questions: 5 questions, 17 marks

Name: _____ Class: _____ Date: _____

PRIMARY 6 · FOUNDATION MATHEMATICS · FRACTIONS

Fractions: Fraction and Division

INSTRUCTIONS

- 25 questions, 52 marks in total.
- Answer all questions in the spaces provided.
- Show your working clearly. Marks are given for correct working.

Section A: Multiple Choice

For each question, four options are given. One of them is the correct answer.
Write the letter (A, B, C or D) of the correct answer in the brackets provided.

1 What is $4 \div 7$ as a fraction? ( ) [1]

(A) $\frac{7}{4}$ (B) $\frac{4}{7}$ (C) $\frac{3}{7}$ (D) $\frac{4}{11}$

2 Express $\frac{3}{25}$ as a decimal. ( ) [1]

(A) 0.12 (B) 0.325 (C) 0.3 (D) 1.2

3 Find $\frac{9}{10} \div 3$. ( ) [1]

(A) $\frac{27}{10}$ (B) $\frac{9}{7}$ (C) $\frac{3}{10}$ (D) $\frac{3}{7}$

4 Find $3 \div \frac{1}{5}$. ( ) [1]

(A) $\frac{3}{5}$ (B) $\frac{1}{15}$ (C) $\frac{5}{3}$ (D) 15

5 Which of these is equal to $11 \div 4$? ( ) [1]

(A) $\frac{4}{11}$ (B) $2\frac{3}{4}$ (C) 2.3 (D) $2\frac{1}{4}$

6 Express $1\frac{7}{8}$ as a decimal. ( ) [2]

(A) 1.78 (B) 1.87 (C) 1.875 (D) 0.875

7 A piece of ribbon $\frac{8}{11}$ m long is cut into 4 equal pieces. How long is each piece? ( ) [2]

(A) $\frac{32}{11}$ m (B) $\frac{4}{11}$ m (C) $\frac{8}{15}$ m (D) $\frac{2}{11}$ m

8 Find $\frac{5}{6} \div \frac{5}{12}$. ( ) [2]

(A) 2 (B) $\frac{1}{2}$ (C) $\frac{25}{72}$ (D) 1

9 A jug has 6 ℓ of water. Each bottle holds $\frac{3}{4}$ ℓ. How many bottles can be filled with all the water? ( ) [2]

(A) $4\frac{1}{2}$ (B) 8 (C) 18 (D) 24

10 Which of the following has the greatest value? ( ) [2]

(A) $9 \div 2$ (B) $\frac{2}{3} \div 2$ (C) $3 \div \frac{1}{2}$ (D) $\frac{4}{5} \div \frac{1}{10}$

Section B: Short Answer

Write your answers in the spaces provided. Each question carries 2 marks.
Show your working clearly.

11 Answer these.

(a) Write $7 \div 12$ as a fraction.

Ans: _____ [1]

(b) Express $\frac{9}{25}$ as a decimal.

Ans: _____ [1]

12 Find $\frac{10}{11} \div 5$. Give your answer in its simplest form.

Ans: _____ [2]

13 Find $8 \div \frac{4}{9}$.

Ans: _____ [2]