



Fractions, Decimals and Percentages

7

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Instructions: Solutions are in low contrast light blue. Print one copy in full colour, then photocopy in black and white, solutions should disappear. If not, turn contrast down on the photocopier.

Focus: A set of questions and solutions for Year 7 students on Fractions, Decimals, and Percentages, tailored to the Australian Curriculum:

1. Converting Between Fractions, Decimals, and Percentages

a) Convert the fraction $\frac{3}{4}$ to a decimal and then to a percentage.

Solution:

$$\frac{3}{4} = 0.75 \text{ (Divide 3 by 4).}$$

0.75 as a percentage is
75% (multiply 0.75 by 100).

b) Change 0.6 into a fraction and then into a percentage.

Solution:

0.6 as a fraction is $\frac{6}{10}$ which simplifies to $\frac{3}{5}$ (Divide top and bottom by 2).

0.6 as a percentage is
60% (multiply 0.6 by 100).



2. Understanding Fractions

a) Simplify $\frac{12}{16}$.

Solution:

Both numerator and denominator can be divided by 4:

$$\begin{array}{r} 12 \div 4 \\ 16 \div 4 \\ \hline = \frac{3}{4} \end{array}$$

b) Which is larger, $\frac{2}{3}$ or $\frac{5}{8}$? Use a common denominator to compare.

Solution:

Convert to common denominators (24):

$$\frac{2 \times 8}{3 \times 8} = \frac{16}{24},$$

$$\frac{5 \times 3}{8 \times 3} = \frac{15}{24}.$$

$$\text{therefore, } \frac{16}{24} > \frac{15}{24},$$

$$\rightarrow \frac{2}{3} > \frac{5}{8}$$

so $\frac{2}{3}$ is larger.



3. Operations with Fractions

a) Add $\frac{1}{5} + \frac{3}{5}$.

Solution:

Since the denominators are the same, add the numerators:

$$\begin{aligned} & \frac{1}{5} + \frac{3}{5} \\ &= \frac{1+3}{5} \\ &= \frac{4}{5}. \end{aligned}$$

b) Multiply $\frac{2}{7}$ by $\frac{3}{4}$, then simplify.

Solution:

Multiply numerators and denominators:

$$\begin{aligned} & \frac{2}{7} \times \frac{3}{4} \\ &= \frac{2 \times 3}{7 \times 4} \\ &= \frac{6 \div 2}{28 \div 2} \\ &= \frac{3}{14}. \end{aligned}$$



4. Decimals:

a) Subtract 1.5 from 3.7.

Solution:

$$3.7 - 1.5 = 2.2.$$

b) Multiply 0.5 by 6.8.

Solution:

$$0.5 \times 6.8 = 3.4.$$

5. Percentages:

a) What is 25 % of 80 ?

Solution:

$$\begin{aligned} & 25 \% \text{ of } 80 \\ &= 0.25 \times 80 \\ &= 20. \end{aligned}$$



b) Increase 60 by 10 % .

Solution:

$$\begin{aligned} & 10 \% \text{ of } 60 \\ &= \frac{10}{100} \times 60 \\ &= 0.1 \times 60 \\ &= 6 \\ \text{So, } 60 + 6 &= 66 . \end{aligned}$$

6. Mixed Operations:

a) Simplify the following: $\frac{1}{2} + 0.25 + 15 \% .$

Solution:

Convert all to the same form, say decimals:

$$\begin{aligned} \frac{1}{2} &= 0.5 , \\ 0.25 &\text{ remains,} \\ 15 \% &= 0.15 . \end{aligned}$$

Then add:

$$\begin{aligned} 0.5 + 0.25 + 0.15 \\ = 0.90 . \end{aligned}$$



b) Sam bought a toy for \$45 and sold it for \$54. What was his profit as a percentage of the cost price?

Solution:

$$\begin{aligned}\text{Profit} &= \$54 - \$45 \\ &= \$9.\end{aligned}$$

$$\begin{aligned}\text{Percentage profit} &= \frac{9}{45} \times 100 \\ &= 20\%.\end{aligned}$$

7. Word Problems:

a) A recipe calls for $\frac{3}{4}$ cup of milk, but you only have 0.6 cups. How much more milk do you need?

Solution:

First convert fraction to decimal :

$$\frac{3}{4} = 0.75 \text{ cup.}$$

$$\begin{aligned}\text{Need } &0.75 - 0.6 \\ &= 0.15 \text{ cups more.}\end{aligned}$$



b) During a sale, the price of a book is reduced by 20 % . If the original price was \$30, what is the sale price?

Solution:

$$\begin{aligned} & 20 \% \text{ of } \$30 \\ &= \frac{20}{100} \times 30 \\ &= 0.2 \times 30 \\ &= \$6. \end{aligned}$$

$$\begin{aligned} \text{Sale price} &= \$30 - \$6 \\ &= \$24. \end{aligned}$$



Solutions

1a.

$$\frac{3}{4} = 0.75 \text{ (Divide 3 by 4).}$$

0.75 as a percentage is **75%** (multiply 0.75 by 100).

b.

0.6 as a fraction is $\frac{6}{10}$, which simplifies to $\frac{3}{5}$ (Divide top and bottom by 2).

0.6 as a percentage is **60%** (multiply 0.6 by 100).

2a.

Both numerator and denominator can be divided by 4:

$$\frac{12 \div 4}{16 \div 4} = \frac{3}{4}.$$

b.

Convert to common denominators (24):

$$\frac{2 \times 8}{3 \times 8} = \frac{16}{24},$$

$$\frac{5 \times 3}{8 \times 3} = \frac{15}{24}.$$

$$\text{therefore, } \frac{16}{24} > \frac{15}{24},$$

$$\rightarrow \frac{2}{3} > \frac{5}{8}$$

so $\frac{2}{3}$ is larger.



3a.

Since the denominators are the same, add the numerators:

$$\begin{aligned} & \frac{1}{5} + \frac{3}{5} \\ &= \frac{1+3}{5} \\ &= \frac{4}{5}. \end{aligned}$$

b.

Multiply numerators and denominators:

$$\begin{aligned} & \frac{2}{7} \times \frac{3}{4} \\ &= \frac{2 \times 3}{7 \times 4} \\ &= \frac{6 \div 2}{28 \div 2} \\ &= \frac{3}{14}. \end{aligned}$$

4a.

$$3.7 - 1.5 = 2.2.$$

b.

$$0.5 \times 6.8 = 3.4.$$

5a.

$$\begin{aligned} & 25 \% \text{ of } 80 \\ &= 0.25 \times 80 \\ &= 20. \end{aligned}$$

b.

$$\begin{aligned} & 10 \% \text{ of } 60 \\ &= \frac{10}{100} \times 60 \\ &= 0.1 \times 60 \\ &= 6 \end{aligned}$$

$$\text{So, } 60 + 6 = 66.$$



6a.

Convert all to the same form, say decimals:

$$\frac{1}{2} = 0.5 ,$$

0.25 remains,
 $15\% = 0.15.$

Then add:

$$0.5 + 0.25 + 0.15$$

$$= 0.90 .$$

b.

$$\text{Profit} = \$54 - \$4$$

$$= \$9 .$$

$$\text{Percentage profit} = \frac{9}{45} \times 100$$

$$= 20\% .$$

7a.

First convert fraction to decimal :

$$\frac{3}{4} = 0.75 \text{ cup} .$$

Need $0.75 - 0.6$

$$= 0.15 \text{ cups more} .$$

b.

$$20\% \text{ of } \$30$$

$$= \frac{20}{100} \times 30$$

$$= 0.2 \times 30$$

$$= \$6 .$$

$$\text{Sale price} = \$30 - \$6$$

$$= \$24 .$$



Additional Notes for Teachers:

Learning Outcomes:

Students should be adept at converting between fractions, decimals, and percentages, performing operations, and applying these concepts in various scenarios.

Teaching Strategies:

Use visual aids like pie charts for percentages or fraction strips for understanding fractions. Engage with real-life scenarios involving discounts, recipes, or budgeting to contextualise learning.

Assessment:

Assess through practical problems, quizzes that require conversion and application of these concepts, and encourage students to explain their methods.

Resources:

Utilise digital tools for interactive practice with conversions, or traditional tools like fraction bars and percentage grids. Consider classroom activities where students perform conversions in groups.

This question set aligns with the Australian Curriculum for Year 7, focusing on the development of numeracy skills through understanding, fluency, problem-solving, and reasoning with fractions, decimals, and percentages.

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