Mathematics
Grade 8

TOPIC:
Common Fractions

Section A: Addition and Subtraction of Fractions

1. Calculate the following. Simplify your answers:

a) $\frac{3}{4}+\frac{5}{8}$

b) $2\frac{1}{3}+1\frac{5}{6}$

c) $\frac{7}{10}-\frac{2}{5}$

d) $3\frac{2}{5}-1\frac{3}{4}$

Section B: Multiplication of Fractions

2. Calculate the following. Simplify your answers:

a) $\frac{2}{3}\times\frac{5}{7}$

b) $\frac{4}{9}\times\frac{3}{8}$

c) $2\frac{1}{4}\times1\frac{2}{3}$

d) $\frac{5}{6}\times 24$

Section C: Division of Fractions

3. Calculate the following. Simplify your answers:

a) $\frac{3}{4}\div\frac{2}{5}$

b) $\frac{5}{8}\div\frac{3}{4}$

c) $6\div\frac{2}{3}$

d) $2\frac{1}{2}\div1\frac{1}{4}$

Section D: Finding Fractions of Whole Numbers

4. Calculate:

a) $\frac{3}{5}$ of 40

b) $\frac{7}{8}$ of 72

c) $2\frac{1}{3}$ of 27

Section E: Squares, Cubes, and Roots of Fractions

5.1 Calculate the following. Leave answers as common fractions:

a) $\left(\frac{2}{3}\right)^2$

b) $\left(\frac{1}{4}\right)^3$

c) $\sqrt{\frac{9}{16}}$

d) $\sqrt[3]{\frac{8}{27}}$

5.2 Calculate the following combinations. Simplify your answers:

a) $\left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^3$

b) $\left(\frac{3}{4}\right)^2 - \left(\frac{1}{2}\right)^2$

c) $\sqrt{\frac{4}{9}} + \frac{2}{3}$

d) $\sqrt{\frac{16}{25}} - \frac{1}{5}$

e) $\left(\frac{2}{3}\right)^2 \times \frac{9}{4}$

f) $\sqrt{\frac{1}{4}} \times \sqrt{\frac{9}{16}}$

g) $\left(\frac{1}{2}\right)^3 \div \frac{1}{4}$

h) $\sqrt[3]{\frac{27}{64}} \div \frac{3}{8}$

5.3 Calculate:

a) $\left(\frac{1}{3}\right)^2 + \left(\frac{1}{4}\right)^2 + \left(\frac{1}{6}\right)^2$

b) $\sqrt{\frac{9}{25}} \times \left(\frac{5}{6}\right)^2$

c) $\left(\frac{4}{5}\right)^2 \div \sqrt{\frac{16}{25}}$

d) $\sqrt[3]{\frac{8}{27}} + \left(\frac{1}{3}\right)^2$

e) $\left(\frac{3}{4}\right)^3 - \left(\frac{1}{2}\right)^3$

f) $\sqrt{\frac{36}{49}} \div \left(\frac{2}{7}\right)^2 + \frac{1}{2}$

Section F: Problem Solving with Fractions

6. Thabo has $\frac{5}{6}$ of a pizza. He shares it equally among 5 friends. What fraction of the whole pizza does each friend receive?

7. A recipe calls for $2\frac{1}{4}$ cups of flour. If you want to make $\frac{2}{3}$of the recipe, how much flour do you need?

8. A water tank is $\frac{3}{4}$ full. After using $\frac{1}{6}$ of the tank's total capacity, what fraction of the tank is now full?

Section G: Percentages of Whole Numbers

9. Calculate:

a) 15% of 80

b) 35% of 240

c) 62,5% of 96

Section H: Percentage of Part of a Whole

10. Express the first number as a percentage of the second:

a) 18 out of 25

b) 45 out of 120

c) 28 out of 35

Section I: Percentage Increase and Decrease

11. Calculate:

a) Increase 60 by 25%

b) Decrease 180 by 40%

c) A shirt costs R120. During a sale, it is reduced by 15%. What is the sale price?

Section J: Working Backwards with Percentages

12. Solve:

a) After a 20% increase, a price is now R360. What was the original price?

b) After a 30% decrease, a quantity is now 84. What was the original quantity?

Section K: Percentage Problems

13. In a class of 32 students, 18 are girls. What percentage of the class are boys?

14. A store marks up the cost of an item by 40% to set the selling price. If an item costs R250, what is the selling price?

15. A savings account has R1 200 and earns 8% interest per year. How much interest is earned in one year?

Section L: Equivalent Forms

16. Complete the table:

Common Fraction	Decimal	Percentage
$\frac{1}{4}$		
	0,6	
		45%
$\frac{7}{8}$		
	0,15	

17. Convert to the form indicated:

a) $\frac{3}{5}$ to a decimal

b) 0,35 to a common fraction in simplest form

c) $\frac{9}{20}$ to a percentage

d) 72% to a common fraction in simplest form

Section M: Mixed Problem Solving

18. A school has 450 learners. 60% are in the senior phase. Of these senior phase learners, $\frac{2}{5}$ participate in sports. How many senior phase learners participate in sports?

19. A baker made 144 cupcakes. She sold $\frac{5}{8}$ of them in the morning and 25% of the remainder in the afternoon. How many cupcakes does she have left?

20. A plot of land measures $\frac{3}{4}$ of a hectare. The owner wants to divide it equally among his 3 children. What fraction of a hectare will each child receive?

Extension Challenge

21. If $\frac{2}{3}$ of a number is 48, what is 87,5% of that number?

22. A price increased by 20%, then decreased by 20%. Is the final price the same as the original? Show all calculations to support your answer.

CAPS CLARIFICATION

Calculations using fractions

- **Revise**:
  - addition and subtraction of common fractions, including mixed numbers
  - finding fractions of whole numbers
  - multiplication of common fractions, including mixed numbers
- Divide whole numbers and common fractions by common fractions
- Calculate the squares, cubes, square roots and cube roots of common fractions

Calculation techniques

- **Revise**:
  - Convert mixed numbers to common fractions in order to perform calculations with them
  - Use knowledge of multiples and factors to write fractions in the simplest form before or after calculations
  - Use knowledge of equivalent fractions to add and subtract common fractions
- Use knowledge of reciprocal relationships to divide common fractions

Solving problems

- Solve problems in contexts involving common fractions and mixed numbers, including grouping, sharing and finding fractions of whole numbers

Percentages

- **Revise**:
  - finding percentages of whole numbers
  - calculating the percentage of part of a whole
  - calculating percentage increase or decrease
- Calculate amounts if given percentage increase or decrease
- Solve problems in contexts involving percentages

Equivalent forms

- **Revise** equivalent forms between:
  - common fractions (fractions where one denominator is a multiple of the other)
  - common fraction and decimal fraction forms of the same number
  - common fraction, decimal fraction and percentage forms of the same number