O Level Maths

Topic: Algebraic Fractions

Instructions

Answer all questions. Show working where necessary. Simplify the given algebraic fractions, and solve the equations involving algebraic fractions.

Practice Problems

Simplify the following algebraic fractions:

1. $\dfrac{3x^2 + 6x}{3x}$

2. $\dfrac{2x^2 - 8}{4x}$

3. $\dfrac{x^2 - 4}{x^2 - 2x}$

4. $\dfrac{5x^2 + 10x}{x^2 + 2x}$

5. $\dfrac{x^2 + 3x - 4}{x^2 - 4}$

6. $\dfrac{3x^2 - 2x}{x^2 - 4x}$

7. $\dfrac{2x^2 - 3x + 4}{x^2 + x - 6}$

8. $\dfrac{4x^2 + 8x}{2x^2 + 4x}$

Word Problems

1. The cost per unit of a product is given by $C(x) = \frac{3x+5}{x+2}$, where x is the number of units produced. Find the cost per unit when 4 units are produced.

2. A recipe for a cake calls for $\frac{3x}{5}$ cups of flour and $\frac{2x}{3}$ cups of sugar, where x is the number of servings. How many cups of flour and sugar are needed for 6 servings?

3. The speed of a car is given by the equation $v = \frac{60t+40}{t+1}$, where t is the time in hours. Find the speed when the time taken is 2 hours.

Multiple-Choice Questions

1. Simplify the algebraic fraction: $\dfrac{4x^2 - 9}{2x^2 - 3x}$.

   A. $\frac{2x+3}{x}$

   B. $\frac{2x-3}{x}$

   C. $\frac{2x+3}{2x}$

   D. $\frac{2x-3}{2x}$

2. Simplify the algebraic fraction: $\dfrac{x^2 + 5x + 6}{x^2 - x - 6}$.

   A. $\frac{x+3}{x-2}$

   B. $\frac{x+2}{x-3}$

   C. $\frac{x+1}{x+2}$

   D. $\frac{x-1}{x+3}$

3. Simplify the expression: $\dfrac{x^2 - 4x}{x^2 - 9}$.

   A. $\frac{x-2}{x-3}$

   B. $\frac{x+2}{x-3}$

   C. $\frac{x-2}{x+3}$

   D. $\frac{x+2}{x+3}$

4. Simplify: $\dfrac{x^2 - 4x}{2x^2 - 8x}$.

   A. $\frac{1}{2}$

   B. $\frac{1}{4}$

   C. $\frac{2}{3}$

   D. $\frac{1}{3}$