

Rational Expressions and Equations

A. Reduce the following expressions:

$$1. \frac{3(x+4y)}{2(x+4y)}$$

$$2. \frac{16a-22}{2}$$

$$3. \frac{z^2-9}{z^2+5z+6}$$

$$4. \frac{3x^2+4x+1}{2x^2+5x+3}$$

$$5. \frac{x^2+2xy+y^2}{(x+y)^2}$$

$$6. \frac{5x^2-5x}{1-x}$$

B. Multiplication and Division

$$1. \frac{x}{a} \cdot \frac{a}{b}$$

$$2. \frac{4a^2c}{b^3} \cdot \frac{3b^2}{12ac^2}$$

$$3. (x-5) \cdot \frac{(x+4)}{5x-25}$$

$$4. \frac{u^2-4}{3} \cdot \frac{4}{u-2}$$

$$5. \frac{x^2+5x+6}{x^2-2x-15} \cdot \frac{x^2-x-20}{x^2+x-2}$$

$$6. \frac{x^2+4x+4}{2x^2-8} \div \frac{x^2+2x}{4x-8}$$

$$7. \frac{x^2+4x}{x^2-16} \div \frac{x^2+8x+15}{x^2+x-20}$$

$$8. \frac{t^2-4}{t^2-25} \div \frac{t-2}{t-5}$$

$$9. \frac{y}{y-5} \cdot \frac{y^2-6y+5}{y^2-1} \cdot \frac{y^2-4y-5}{y^2-5y}$$

C. Addition and Subtraction

$$1. \frac{5y}{x^3y} + \frac{7y}{x^3y}$$

$$2. \frac{3x^2+5x-2}{x+2} - \frac{x^2-6x+3}{x+2}$$

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

$$4. \frac{-8}{x^2-x-12} + \frac{3}{x^2-16}$$

$$5. \frac{-4}{2x^2+5x+3} + \frac{2}{4x^2-9}$$

D. Solving Equations:

$$1. \frac{2}{5} + \frac{t}{4} = 1$$

$$2. \frac{x+1}{3} - \frac{x+2}{6} = \frac{x+5}{4}$$

$$3. \frac{x}{3} + \frac{x}{4} = \frac{7}{2}$$

$$4. \frac{4}{x-5} + \frac{3}{x+5} = \frac{40}{x^2-25}$$

$$5. \frac{5}{x-10} + \frac{2}{x-4} = \frac{9}{x^2-14x+40}$$

$$6. \frac{5x}{x+1} + \frac{4}{x} = 9$$