

1. Simplify each rational expression (Section 4.1)

a.

$$\frac{-30x^2y^2z^2}{-35xz^3}$$

b.

$$\frac{60x^3z}{-64xy^2z^3}$$

c.

$$\frac{xy + y^2}{x^2 - y^2}$$

d.

$$\frac{a^2 + 4a - 32}{3a^2 + 26a + 16}$$

e.

$$\frac{9 - y}{y^2 - 81}$$

2. Express in simplest form (Section 4.2)

a.

$$\frac{5xy}{7a} * \frac{14a^2}{15x} * \frac{3a}{8y}$$

b.

$$\frac{5xy}{x+6} * \frac{x^2-36}{x^2-6x}$$

c.

$$\frac{7xy}{x^2-4x+4} \div \frac{14y}{x^2-4}$$

d.

$$\frac{x^2-x}{4y} * \frac{10xy^2}{2x-2} \div \frac{3x^2+3x}{15x^2y^2}$$

3. Add or subtract as indicated. Express your answer in simplest form. (Sections 4.3 & 4.4)

a.

$$\frac{3x}{2x+1} - \frac{5}{2x+1}$$

b.

$$\frac{2a+1}{9} - \frac{a+3}{12}$$

c.

$$\frac{7}{3x} - \frac{8}{7y} + 2$$

d.

$$\frac{5}{x-1} - \frac{3}{2x-3}$$

e.

$$\frac{6}{a^2 - 3a - 54} - \frac{10}{a^2 + 5a - 6}$$

f.

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

4. Perform the indicated division (Section 4.5)

a.

$$\frac{-18x^2y^2 + 24x^3y^2 - 48x^2y^3}{6xy}$$

b.

$$\frac{x^3 - 125}{x - 5}$$

c.

$$(2x^3 - x - 6) \div (x + 2)$$

d.

$$(2x^3 + x^2 - 3x + 1) \div (x^2 + x - 1)$$