

Name : _____

1. Factor the following expressions completely.

(a) $y^2 + 9y + 8$

(b) $z^2 - 10z + 9$

(c) $9x - xy^2$

(d) $3x^2 - 18x + 15$

2. Simplify the rational expressions using only positive exponents

(a) $\frac{axy}{bxy}$

(b) $\frac{3x^2 + 6x}{3x}$

3. Simplify the expressions.

$$(a) \frac{a(3y+2)^2(y-1)}{7(3y+2)^2(y-1)^2}$$

$$(b) \frac{a^2 - 4}{a^3 + 2a^2}$$

$$(c) \frac{x^2 - 9}{x^2 + 2x - 3}$$

4. Perform the indicated operations and simplify.

$$(a) \frac{17rs^2}{12t^3} \cdot \frac{3t^2}{51s}$$

$$(b) \frac{(x+y)(2x+y)}{x-y} \cdot \frac{x(x-y)}{x+y}$$

$$(c) \frac{4x+8}{x+1} \cdot \frac{x^2+x}{x^2-4}$$

(d) $\frac{5y}{3x^3} \div \frac{75y}{18x^2}$

(e) $\frac{2x^2 - 18}{x^2 - 4} \div \frac{2x + 6}{x^2 - 2x}$

5. Perform the operation indicated and simplify.

(a) $\frac{2a}{x^2y} + \frac{3a}{x^2y}$

(b) $\frac{7x}{x+y} - \frac{4x}{x+y}$

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

(d) $\frac{1}{x^2 - x} - \frac{3}{x^2 + 2x}$

(e) $\frac{a - b}{a^2(a + b)} - \frac{1}{a(a - b)}$

6. Perform the indicated operations and simplify. All letters represent positive rational numbers.

(a) $-\sqrt{20} + \sqrt{45}$

(b) $\sqrt{3} - 5\sqrt{27}$

(c) $(2\sqrt{11} + \sqrt{3})(2\sqrt{11} - \sqrt{3})$

(d) $\frac{-4 + 6\sqrt{3}}{2}$