

## Chapter 3 Prerequisite Skills

1. Multiply. Then, combine like terms.

a)  $(4x + 2) + (2x - 3)(3x - 2)$

b)  $(y + 5)(2y - 3) - (4y + 1)^2$

c)  $(a - 2b)(5a - 3b) - (a + b)(4a + b)$

d)  $(y^2 - 5y - 6)(4y^2 + 6y + 1)$

2. Identify the GCF for each set of terms.

a)  $15a^2b$  and  $18ab$

b)  $27m^2n^3$  and  $81m^3n$

c)  $12a^3bc^2$ ,  $28a^2c$ , and  $36a^2b^2c^2$

d)  $14p^4q^5$ ,  $-24p^5q^4$ , and  $7p^3q^3$

3. Factor the following polynomials.

a)  $3y(y - 2) + 4(y - 2)$

b)  $5a(a - 4) - 2(a - 4)$

c)  $2cx - 8x + 7c - 28$

d)  $2y^4 + y^3 - 10y - 5$

4. Factor each trinomial.

a)  $4x^2 - 11x + 6$

b)  $2m^2 + 3m - 9$

c)  $a^2 + 11ab + 24b^2$

d)  $6x^2 - 3xy - 3y^2$

5. Determine two values of  $n$  that make each polynomial a perfect square trinomial. Then, factor.

a)  $x^2 + nx + 25$

b)  $36t^2 + nt + 121$

6. Simplify each rational expression. State the restrictions on the variables.

a)  $\frac{2c(c - 5)}{3c(c - 5)}$

b)  $\frac{3w(2w + 3)}{2w(3w + 2)}$

c)  $\frac{(x + 7)(x - 7)}{(2x - 1)(x - 7)}$

d)  $\frac{5(a - 3)(a + 2)}{10(3 - a)(a + 2)}$

e)  $\frac{6r^2p^3}{3rp^4}$

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

7. Write each product in simplest form. Identify all restrictions on the variables.

a)  $\frac{d^2 - 100}{144} \times \frac{36}{d + 10}$

b)  $\frac{a + 3}{a + 1} \times \frac{a^2 - 1}{a^2 - 9}$

c)  $\frac{4z^2 - 25}{2z^2 - 13z + 20} \times \frac{z - 4}{4z + 10}$

d)  $\frac{2p^2 + 5p - 3}{2p - 3} \times \frac{p^2 - 1}{6p - 3} \times \frac{2p - 3}{p^2 + 2p - 3}$

8. Express each quotient in simplest form. Identify all restrictions on the variables.

a)  $\frac{2w^2 - w - 6}{3w + 6} \div \frac{2w + 3}{w + 2}$

b)  $\frac{v - 5}{v} \div \frac{v^2 - 2v - 15}{v^3}$

c)  $\frac{-9x^2 + 1}{x + 5} \div \frac{3x^2 - 5x - 2}{2 - x}$

d)  $\frac{8y^2 - 2y - 3}{y^2 - 1} \div \frac{2y^2 - 3y - 2}{2y - 2} \div \frac{3 - 4y}{y + 1}$

9. The volume of a rectangular prism is  $2x^3 + 4x^2 - 16x \text{ cm}^3$ . If the prism's length is  $2x - 6 \text{ cm}$  and its width is  $x + 4 \text{ cm}$ , what is an expression for the height of the prism?



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(continued)

- 10.** Perform the indicated operations. Express answers in simplest form and identify any restrictions on the variables.

a)  $\frac{4x-3}{6} - \frac{x-2}{4}$

b)  $\frac{2y-1}{3y} + \frac{y-2}{2y} - \frac{y-8}{6y}$

c)  $\frac{9}{x-3} + \frac{7}{x^2-9}$

d)  $\frac{a}{a-b} - \frac{2ab}{a^2-b^2} + \frac{b}{a+b}$

e)  $\frac{a}{a+3} - \frac{a^2-3a}{a^2+a-6}$

- 11.** Lauren and her family drove from Prince George, BC, to Jasper, AB, for a ski holiday. Each way, the distance is 380 km. On the return trip, the road conditions had improved from when they had driven to Jasper. As a result, they were able to increase their average speed by 10 km/h on their way home. If the total driving time for the round trip was 9 hours, what was the average speed from Prince George to Jasper?

