

# Chapter 4 Prerequisite Skills

1. Multiply and combine like terms.

- a)  $3(2x - 7) - 4(x - 1)$
- b)  $5x(3x - 2)$
- c)  $(4x - 3)(2x + 5)$
- d)  $(5x - 4)^2$

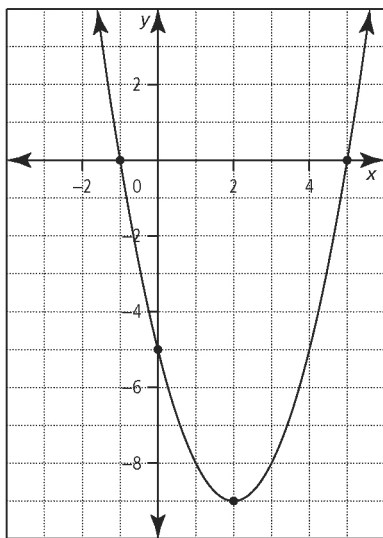
2. Factor fully.

- a)  $3xy - 8x^2y$
- b)  $3p - 9p^2$
- c)  $x^2 - 13x + 12$
- d)  $4a^2 - 9y^2$
- e)  $8r^2 + 20r + 8$
- f)  $2x^2 - 0.08y^2$

3. Solve for  $x$ . Check your answer for part a).

- a)  $7x - 3 = 2x - 5$
- b)  $19 - 2(x + 3) = 1$
- c)  $(4x + 3)(x - 1) = (2x - 1)(2x + 1)$

4. Use the graph to help determine each of the following:



- a) coordinates of the vertex
- b) equation of the axis of symmetry
- c) range of the function
- d)  $y$ -intercept
- e)  $x$ -intercepts

5. A quadratic function is represented by  $g(x) = 2x^2 - 6x + 3$ .

- a) What is the value of the function when  $x = -1$ ?
- b) What is  $g\left(\frac{3}{2}\right)$ ?

6. For the equation  $y = -2(x - 3)^2 + 5$ , explain how you can identify each of the following without graphing:

- a) the equation of the axis of symmetry
- b) coordinates of the vertex
- c) whether the function has a maximum or minimum value
- d) the nature of the  $x$ -intercepts
- e) value of the  $y$ -intercept

7. Sketch each parabola. Label the vertex and axis of symmetry.

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

8. Convert each equation to the form  $y = ax^2 + bx + c$ . What are the values of  $a$ ,  $b$ , and  $c$ ?

- a)  $y = -3(x - 1)^2 + 2$
- b)  $y = \frac{3}{2}(x + 4)^2 - 5$

9. Convert each equation to the form  $y = a(x - p)^2 + q$  by completing the square. Determine the value for  $a$ ,  $p$ , and  $q$  in each case.

- a)  $y = x^2 - 10x + 31$
- b)  $y = 6x^2 + 24x + 17$
- c)  $y = -4x^2 + 20x - 3$

10. A business models its costs with the function  $C(n) = 30n^2 - 720n + 6000$ , where  $C(n)$  is the cost, in dollars, of producing  $n$  items. Determine the number of items that must be produced to create the minimum cost for the business.

