

Chapter 1 Prerequisite Skills

1. For each function, identify the following:

- the vertex
- whether the vertex is a maximum or minimum value
- the axis of symmetry
- the direction of opening
- the domain and range

a) $f(x) = (x - 3)^2 + 4$

b) $f(x) = \frac{1}{2}(x + 5)^2 - 7$

c) $f(x) = -3x^2 + 15$

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

2. Write each function in vertex form.

a) $y = x^2 - 24x + 10$

b) $y = 5x^2 + 40x - 27$

c) $y = -2x^2 + 8x$

d) $y = -30x^2 - 60x + 105$

3. Graph each quadratic function in #2. Label the vertex and x -intercepts (if any exist), rounded to the nearest tenth of a unit.

4. Evaluate.

a) $|-7|$

b) $|4 - 9|$

c) $3|6| - 24$

d) $|-6 + 3| + \left| 4\left(-\frac{3}{2}\right) \right|$

5. Graph.

a) $y = |3x + 4|$

b) $y = |x^2 - 5|$

c) $y = |2x^2 - x - 1|$

d) $y = \left| -\frac{1}{2}x - 3 \right|$

6. Solve graphically.

a) $|2x - 2| = 9$

b) $|3x - 7| = x + 1$

c) $|x^2 - 6| = 3$

d) $|x^2 - 4x| = 5$

7. Solve each equation in #6 algebraically.

8. Graph the reciprocal of each function. Identify any vertical asymptotes and non-permissible values.

a) $f(x) = 4x - 7$

b) $f(x) = -2x + 5$

c) $f(x) = x^2 - 16$

d) $f(x) = x^2 - x - 6$

