

Chapter 1 Practice Test

For questions 1 to 3, choose the best answer.

1. Which relation is not a function?

- A $\{(1, 1), (2, 1), (3, 1), (4, 1), (5, 1)\}$
- B $y = 3x + 9$
- C $y = x^2 - 3$
- D $x = 2$

2. Which set of numbers best represents the range of the parabola given by

$$y = -2(x + 2)^2 - 10?$$

- A any real number greater than or equal to 10
- B $\{y \in \mathbf{R} \mid y \geq -10\}$
- C $\{y \in \mathbf{R} \mid y \leq -10\}$
- D $\{y \in \mathbf{R} \mid y \geq 10\}$

3. Which statement is not true for the parabola given by $h(t) = 2(t - 20)^2 + 50$?

- A Its vertex is located at $(20, 50)$.
- B It opens downward.
- C It passes through the point $(5, 500)$.
- D The range is any real number greater than or equal to 50.

4. Write the domain and range of each function. Sketch a graph to help.

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

5. Write the equation for the graph resulting from each transformation.

- a) The graph of $f(x) = x^2$ is translated 2 units right.
- b) The graph of $h(t) = t^2$ is translated 3 units down.
- c) The graph of $A(r) = \pi r^2$ is translated 2 units left.
- d) The graph of $f(x) = 3x^2$ is translated 1 unit up.

6. Write the coordinates of the vertex in each graph.

- a) $f(x) = x^2 - 5$
- b) $g(x) = (x + 2)^2 - 10$
- c) $h(x) = -(x - 1)^2$
- d) $t(x) = 2(x + 1)^2 - 10$

7. Write an equation for the parabola that satisfies each set of conditions.

- a) vertex $(2, 0)$
congruent in shape to the graph of $y = x^2$
range: $\{y \in \mathbf{R} \mid y \leq 0\}$
 y -intercept: -4
- b) vertex $(-1, -1)$
opens downward
 y -intercept: -2

8. Describe the graph of each function in terms of transformations on the graph of $y = x^2$.

- a) $y = x^2 - 3$
- b) $y = (x + 3)^2 - 4$
- c) $y = 6(x + 1)^2$
- d) $y = (x - 10)^2 + 1$

9. A parabola is modelled by the function $g(x) = -(x + 2)^2 - 3$.

- a) Sketch the parabola. Label the vertex, axis of symmetry, and two other points.
- b) Write the domain and range of the function.

10. The graph of the function $f(x) = x^2$ is stretched vertically and then translated 3 units to the right and 5 units up. The y -intercept of the resulting graph is 23. Find an equation for the function after these transformations.