

# 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.