Name: _____   Date: _____

Chapter 1 Prerequisite Skills

Function Notation

1. Determine each value for the function
   $f(x) = -5x - 9$.
   a) $f(2)$ **b)** $f(-4)$
   c) $f(-3x)$ **d)** $f(m + 1)$

2. Determine each value for the function
   $f(x) = -x^2 + 4x - 3$.
   a) $f(-1)$ **b)** $f(0)$
   c) $f(-2x)$ **d)** $2f(m - 1)$

Slope and *y*-intercept of a Line

3. State the slope and the *y*-intercept of each
   line
   a) $y = -4x - 1$ **b)** $3y = 9x + 2$
   c) $2x - 4y + 12 = 0$ **d)** $x + 2y = 6(x - 1)$

Equation of a Line

4. Determine an equation for the line that
   satisfies the following conditions.
   a) The slope is $\dfrac{2}{5}$ and the *y*-intercept is –2.

   b) The slope is $\dfrac{1}{3}$ and the line passes

   through the point (6, –2).
   c) The line passes through the points
   (–3, 4) and (2, –1).

Finite Differences

5. Use finite differences to determine if
   each function is linear, quadratic, or
   neither.
   a)

x	y
−2	0
−1	−4
0	−6
1	−6
2	−4
3	0

   b)

x	y
−3	−28
−2	0
−1	10
0	8
1	0
2	−8

Domain and Range

6. State the domain and range of each
   function.
   a) $y = -3(x - 2)^2 - 1$
   b) $y = \sqrt{-3x - 4}$

Quadratic Functions

7. Determine the equation of a quadratic
   function that has *y*-intercept 4 and
   x-intercepts –2 and 3.

8. Determine the *x*-intercepts, the vertex,
   the direction of opening, and the domain
   and range of each quadratic function.
   Then, graph each function.
   a) $y = 3(x - 1)^2 - 3$
   b) $y = (x - 2)(x + 4)$
   c) $y = -0.5(x + 1)(x - 5)$

Transformations

9. Describe each transformation that must
   be applied to the function $y = f(x)$.
   a) $y = 2f(x - 5)$
   b) $y = f(x + 1) - 4$
   c) $y = -f(3x) + 1$

10. **i)** Write an equation for the transformed
    function of each base function.
    ii) Sketch a graph of each function.
    iii) State the domain and range of each
    function.
    a) $f(x) = x$ is compressed vertically by a
    factor of $\dfrac{1}{3}$, reflected in the *x*-axis and
    translated 4 units to the right.
    b) $f(x) = x^2$ is stretched vertically by a
    factor of 3, compressed horizontally
    by a factor of $\dfrac{1}{2}$ and translated 6 units
    to the left and 5 units down.

11. Describe the transformation that must be
    applied to the base function $y = x^2$ to
    obtain the graph of the function
    $y = -\left(\dfrac{1}{2}x - 4\right) + 3$.