Assignment

Write

Describe the number of possible real zeros for any quadratic function.

Remember

The solutions to a quadratic equation can be represented as the axis of symmetry plus or minus its distance to the parabola.

Practice

1. Sketch a graph of each quadratic function. Determine the zeros of each function and write each in terms of the axis of symmetry and its distance to the parabola.
   a. $f(x) = (x - 3)^2$
   b. $f(x) = (x + 5)^2$
   c. $f(x) = \left(x - \frac{1}{2}\right)^2$
   d. $f(x) = (x - 6)^2$
   e. $f(x) = \left(x + \frac{15}{7}\right)^2$
   f. $f(x) = (x + 7)^2$

2. Sketch a graph of each quadratic function. Determine the zeros of each function and write in terms of the axis of symmetry and its distance to the parabola.
   a. $f(x) = 2(x - 1)^2 - 1$
   b. $f(x) = \frac{1}{2}(x + 2)^2 - 5$
   c. $f(x) = 4\left(x + \frac{1}{3}\right)^2 - 1$
   d. $f(x) = -3(x - 6)^2$
   e. $f(x) = \frac{3}{4}(x + 5)^2 - \frac{2}{3}$
   f. $f(x) = (x - 4)^2 - 2$

Stretch

A quadratic function has zeros at $x = -2 \pm \sqrt{15}$. Write the function in general form. Show your work.

Review

1. Use the given characteristics to write a function $R(x)$ in vertex form. Then, sketch the graph of $R(x)$ and the basic function $f(x) = x^2$ on a coordinate plane.
   a. The function has an absolute maximum, is vertically dilated by a factor of $\frac{1}{3}$, and is translated 8 units down and 4 units to the left.
   b. The function has an absolute minimum, is vertically dilated by a factor of 4, and is translated 2 units up and 6 units to the right.
2. Estimate the value of the radical expression $\sqrt{54}$. Then, rewrite the radical by extracting all perfect squares, if possible.
3. Rewrite the quadratic function, $f(x) = 16x^2 - 3$, as the product of linear factors.
4. Identify the form of each quadratic equation. Then identify what characteristic of the function can be determined by the structure of the equation.
   a. $y = (x - 7)(x + 5)$
   b. $y = -3(x + 1)^2 - 4$