# Assignment

## Write

1. Write a quadratic function for each form and state whether the form helps determine the x-intercepts, the y-intercept, or the vertex of the graph.
   a. Standard form
   b. Factored form
   c. Vertex form
2. Describe how to determine the concavity of a parabola.

## Remember

The form of a quadratic function—standard, factored, or vertex—reveals different key characteristics, such as the x-intercept(s), y-intercept, vertex, axis of symmetry, and concavity up or down.

Given three points, you can determine a unique quadratic function algebraically by writing and solving a system of equations.

## Practice

1. Write a quadratic equation for the parabola that passes through the point (2, −3) with roots (−6, 0) and (4, 0).
2. Mitzu shoots an arrow from an initial height of 2 meters. The arrow reaches its maximum height of 20 meters after it has flown a distance of 60 meters.
   a. Write a quadratic function to represent the height of the arrow as a function of its distance.
   b. Determine the height of the arrow after it has flown a distance of 100 meters.
3. Use your knowledge of reference points to write an equation for the quadratic function that has a vertex at (4, −3) and passes through (6, −1) .
4. Write a quadratic equation that passes through the points (−2, 8), (1, 14), and (0, 10) .

## Stretch

Use algebra to write a quadratic equation that passes through the points $\left(\frac{1}{2}, \frac{9}{16}\right)$, $\left(1, \frac{9}{2}\right)$, and $\left(-1, \frac{11}{2}\right)$.

# Review

1. Anita is on a competitive rowing team. After 2 minutes, the team rows at a constant speed of 4 meters per second. Which function represents the distance the boat travels as a function of the number of seconds they have rowed after the first 2 minutes? Explain your reasoning.

$f_1(x) = 4x^2 + 2$                $f_2(x) = 4x$              $f_3(x) = 4^x$

2. The figures shown represent a visual pattern of tiles.

   a. Write the function $w(n)$ to represent the number of white blocks in Figure $n$.

   b. Write the function $b(n)$ to represent the number of black blocks in Figure $n$.

   c. The total number of blocks in Figure $n$ can be represented by the function $t(n) = (n + 2)(n + 2)$.

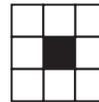   Use the functions you wrote to show that $t(n) = w(n) + b(n)$.
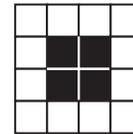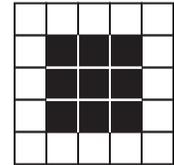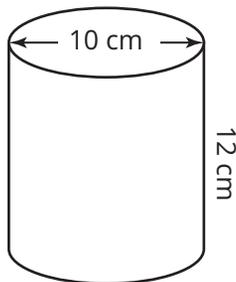


Figure 1      Figure 2      Figure 3

3. Determine the volume of each figure. Round your answer to the nearest hundredth.

   a. Cylinder



   b. Cone