LESSON 2.1 Assignment

Name _____ Date _____

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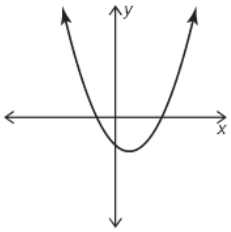
Shape and Structure
Forms of Quadratic Functions

1. Analyze the graph of the quadratic function.



   a. The standard form of a quadratic function is $f(x) = ax^2 + bx + c$. What possible values can a and c have for the given quadratic function? Explain your reasoning.

   b. The vertex form of a quadratic function is $f(x) = a(x - h)^2 + k$. What possible values can a, h, and k have for the given quadratic function? Explain your reasoning.

   c. The factored form of a quadratic function is $f(x) = a(x - r_1)(x - r_2)$. What possible values can a, r_1, and r_2 have? Explain your reasoning.

2. Write a quadratic function for the parabola that passes through the point (2, −3) with roots (−6, 0) and (4, 0).

3. 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.

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   b. Determine the height of the arrow after it has flown a distance of 100 meters.

4. Charlie kicks a soccer ball from the ground through a hoop that is 80 feet away at a height of 20 feet. The ball hits the ground 100 feet from where Charlie kicked it.

   a. Write a quadratic function to represent the height of the ball as a function of its distance.

   b. Determine the maximum height of the ball during its flight.