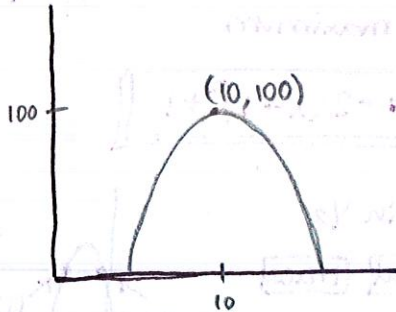


Apply: Quadratic Transformation Trek Practice

Identify the appropriate form of the quadratic equation that represents the given scenario and explain your reasoning. Assume  $a=1$  for all questions. Create a sketch of the graph of the quadratic function based on the chosen form and describe the key features of the graph within the context of the scenario.

**Scenario 1:** You are designing a roller coaster for an amusement park. The highest point of the roller coaster needs to be at a height of 100 feet, and the vertex of the parabolic path is at the point  $(10, 100)$ . Which form of the quadratic equation represents the height of the roller coaster as it moves along the path?

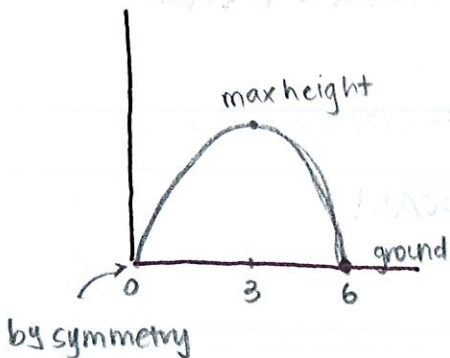


Use vertex form:

$$(10, 100) \rightarrow (h, k)$$

$$y = (x - 10)^2 + 100$$

**Scenario 2:** A soccer ball is kicked into the air with an initial velocity. The path of the ball can be modeled by a quadratic equation. The ball reaches its maximum height after 3 seconds and lands on the ground after 6 seconds. Which form of the quadratic equation best represents the height of the soccer ball?



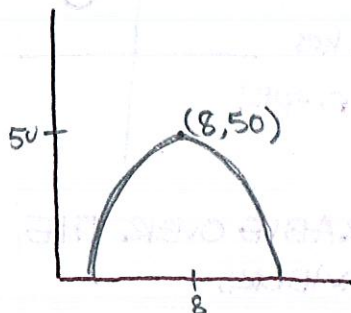
Use factored form:

$$(0, 0) \rightarrow (p, 0) \quad \& \quad (6, 0) \rightarrow (q, 0)$$

$$y = (x - 0)(x - 6)$$

$$y = x(x - 6)$$

**Scenario 3:** A drone is flying along a parabolic path, capturing aerial footage. The drone reaches its maximum height at  $x = 8$ , and the maximum height is 50 feet. Which form of the quadratic equation best represents the height of the drone as it moves along its path?



Use vertex form

$$(8, 50) \rightarrow (h, k)$$

$$y = (x - 8)^2 + 50$$