11.1.D3 – QUADRATIC FUNCTIONS

Name: _____

Past due on: _____ Period: _____
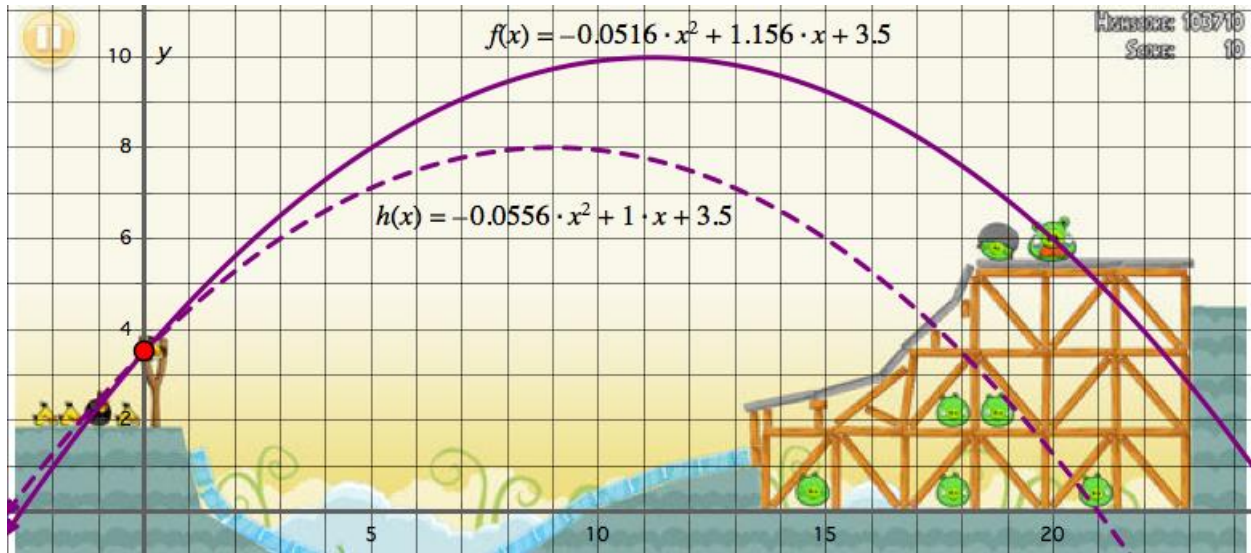
The functions $f(x)$ & $h(x)$ show the angry bird's height (in meters) as a function of his horizontal distance from the base of the slingshot, x (also in meters).

$$f(x) = -0.0516x^2 + 1.156x + 3.5 \qquad\qquad h(x) = -0.0556x^2 + 1x + 3.5$$

1. What is the value of c (of either function) and what does it represent in terms of the contextual situation?

2. Use Desmos to graph the flight path given by the function $f(x)$.

   a. What are the coordinates of the absolute maximum? Describe what the coordinates represent in terms of the problem situation.

   b. What are the coordinates of the x-intercepts? Explain what each means in terms of the problem situation.

   c. What is the angry bird's horizontal distance from the base of the slingshot when he reaches a height of 7 feet?

3. Use Desmos to graph the flight path given by the function $h(x)$.

   a. What are the coordinates of the absolute maximum?

   b. What are the coordinates of the x-intercepts?

   c. What is the angry bird's horizontal distance from the base of the slingshot when he reaches a height of 5 feet?

4. Chuck's flight path can be modeled by the quadratic function $y = -x^2 + 14x - 24$.

   a. What is Chuck's absolute maximum?

   b. King Pig is located at point $(21, 19.5)$ and Moustache Pig is located at point $(9, 21)$. Chuck only hits one of them. Which pig? Explain your reasoning.

   c. Red's flight path is represented in the graph (shown at right). Who flew higher: Chuck or Red?

   d. Who travelled the greater horizontal distance from the slingshot: Chuck or Red? Explain your reasoning.
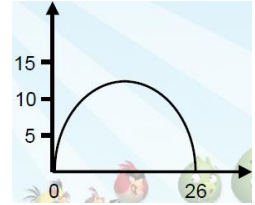
Determine whether the function has an absolute maximum or an absolute minimum. Then, use a graphing calculator, or Desmos, the find the coordinates of the absolute maximum or absolute minimum.

5. $y = x^2 - 6x + 4$

6. $f(x) = x^2 - 3x + 3$

7. $h(t) = -3x^2 + 9x + 2$

8. $y = 0.5x^2 + 0.8x - 2$

9. $g(x) = \dfrac{1}{2}x^2 - 3x + 2$

10. $A(x) = -\dfrac{3}{8}x^2 + 6x - 5$