

Exploring Functions

Name _____ Date _____

1. As a submarine descends into the ocean, the pressure on its hull increases, as recorded in the table at right.
 - a. Using words and symbols, describe a function that relates the depth of the submarine and the pressure on its hull.

Depth (meters)	Pressure ($\frac{\text{kg}}{\text{cm}^2}$)
0	0
300	32
600	64
900	96
1,200	128
1,500	160

- b. Using a graphing calculator, graph the function that relates the depth of the submarine and the pressure on its hull. Make a sketch of the graph below.

- c. Give the domain and range of the function.

- d. How does the situation restrict the domain and range of the function?

- e. When the submarine is submerged at 1,575 meters, what is the pressure on the hull?

- f. If the hull pressure is $240\frac{\text{kg}}{\text{cm}^2}$, at what depth is the submarine?

- g. Give the x-intercept and y-intercept of this function. What do they represent in the situation?

2. When a firework launches with an initial velocity of 150 feet per second from a 25 foot platform, the height of the firework over time can be modeled using the equation $y = -16t^2 + 150t + 25$, where t is the time in seconds
- Using a graphing calculator, graph the function that relates the height of the firework to the number of seconds the firework is in the air. Make a sketch of the graph below.
 - Give the domain and range of the function.
 - How does the situation restrict the domain and range of the function?
 - Determine the height of the firework after 3 seconds.
 - How long will it take the firework to reach a height of 375 feet?
 - Give the x -intercept and y -intercept of this function. What do they represent in the situation?
 - What are the zeros of this function? What do they represent in the situation?