

Name \_\_\_\_\_

Date \_\_\_\_\_

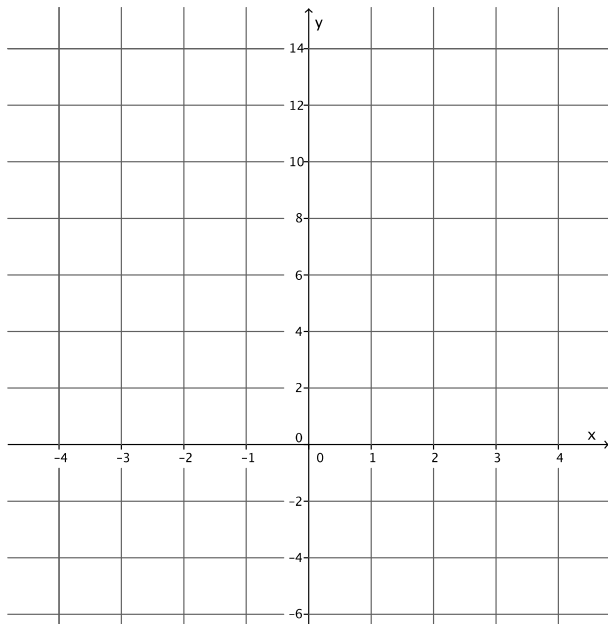
- 1.
- a. We define  $x$  as a year between 2008 and 2013, and  $y$  as the total number of smartphones sold that year, in millions. The table shows values of  $x$ , and corresponding  $y$  values.

Year ( $x$ )	2008	2009	2010	2011	2012	2013
Number of smartphones in millions ( $y$ )	3.7	17.3	42.4	90	125	153.2

- i. How many smartphones were sold in 2009?
- ii. In which year were 90 million smartphones sold?
- iii. Is  $y$  a function of  $x$ ? Explain why or why not.
- b. Randy began completing the table below to represent a particular linear function. Write an equation to represent the function he used, and complete the table for him.

Input ( $x$ )	-3	-1	0	$\frac{1}{2}$	1	2	3
Output ( $y$ )	-5		4				13

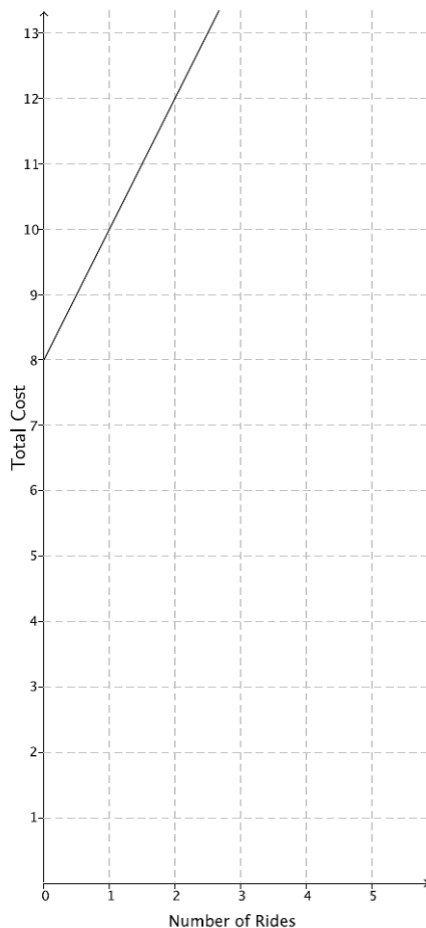
c. Create the graph of the function in part (b).



d. At NYU in 2013, the cost of the weekly meal plan options could be described as a function of the number of meals. Is the cost of the meal plan a linear or non-linear function? Explain.

- 8 meals: \$125/week
- 10 meals: \$135/week
- 12 meals: \$155/week
- 21 meals: \$220/week

2. The cost to enter and go on rides at a local water park, Wally’s Water World, is shown in the graph below.



A new water park just opened named Tony’s Tidal Takeover. You haven’t heard anything specific about how much it costs to go to this park, but some of your friends have told you what they spent. The information is organized in the table below.

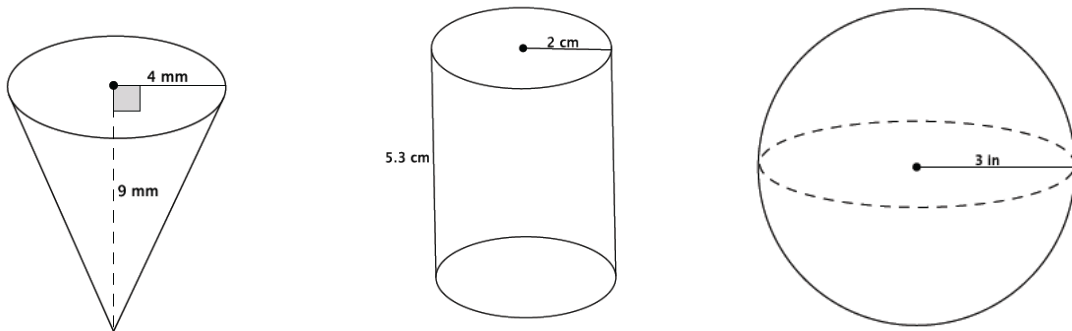
# of rides	0	2	4	6
\$ spent	12	13.50	15	16.50

Each park charges a different admission fee and a different fee per ride, but the cost of each ride remains the same.

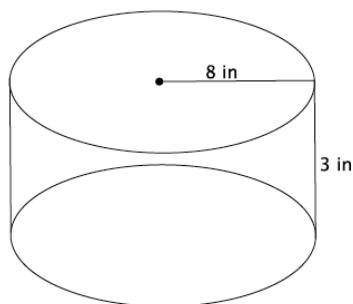
- a. If you only have \$14 to spend, which park would you attend (assume the rides are the same quality)? Explain.

- b. Another water park, Splash, opens and they charge an admission fee of \$30 with no additional fee for rides. At what number of rides does it become more expensive to go to Wally's Water Park than Splash? At what number of rides does it become more expensive to go to Tony's Tidal Takeover than Splash?
- c. For all three water parks, the cost is a function of the number of rides. Compare the functions for all three water parks in terms of their rate of change. Describe the impact it has on the total cost of attending each park.

3. For each part below, leave your answers in terms of  $\pi$ .
- a. Determine the volume for each three-dimensional figure shown below.



- b. You want to fill the cylinder shown below with water. All you have is a container shaped like a cone with a radius of 3 inches and a height of 5 inches; you can use this cone-shaped container to take water from a faucet and fill the cylinder. How many cones will it take to fill the cylinder?



- c. You have a cylinder with a diameter of 15 inches and height of 12 inches. What is the volume of the largest sphere that will fit inside of it?

