

TOPIC 1 QUANTITIES AND RELATIONSHIPS

END OF TOPIC TEST (FORM B)

Name _____ Date _____

1 A botanist has determined that there is a relationship between how much a certain plant grows and how much water it receives. Identify the independent quantity and the dependent quantity in this problem situation.

2 Consider each scenario. Analyze each graph and determine which of the provided scenarios it models. Explain your reasoning. Then for each graph, label the x - and y -axis with the appropriate quantity and unit of measure.

a Taking a Bath scenario

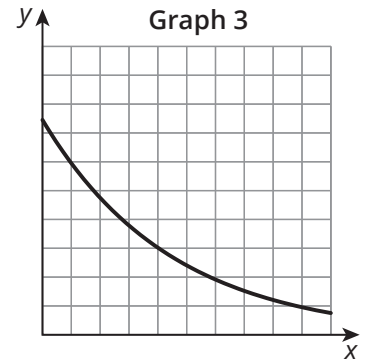
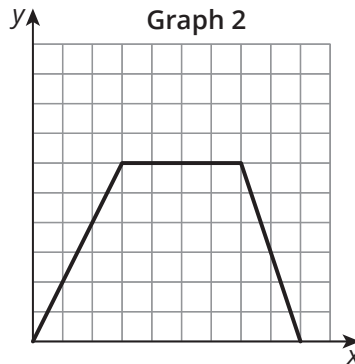
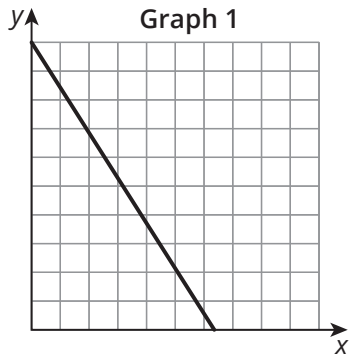
Tessa fills a bathtub at a constant rate until it has 60 gallons of water. She takes a bath for 20 minutes. Then she drains the bathtub at a faster rate than it filled.

b Mountain Hike scenario

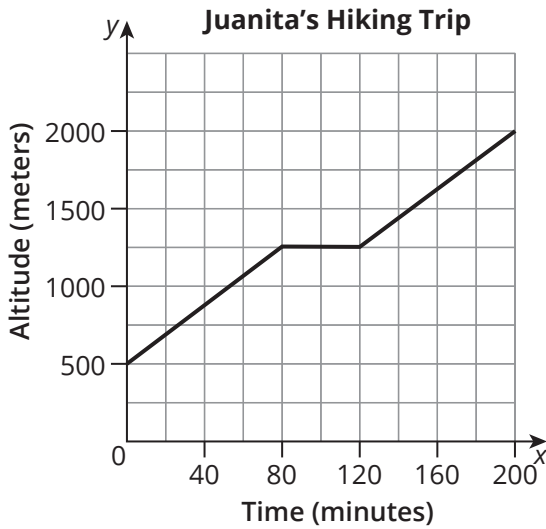
Nadine begins at an elevation of 2000 meters and hikes down a mountain trail at a rate of 320 meters each hour.

c Car Value scenario

A car is purchased for \$15,000. It loses value rapidly at first, and then loses value more slowly until it worth about \$1600 after 10 years.



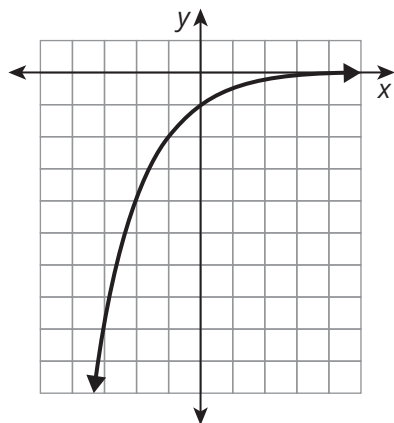
- 3 Juanita and her friends went on a hiking trip. They hiked a mountain trail, stopped to eat lunch, and then continued toward the summit of the mountain. The graph represents this situation.



- a Identify the domain and range.
- b Is the graph discrete or continuous?
- c Identify the maximum point and explain what it means in the problem situation.
- d Is the graph increasing, decreasing, both increasing and decreasing, or constant?
Explain your reasoning.

4 Determine whether each relationship represents a function. Explain why or why not.

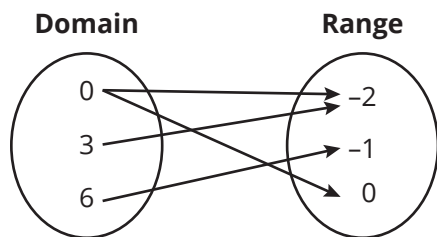
a



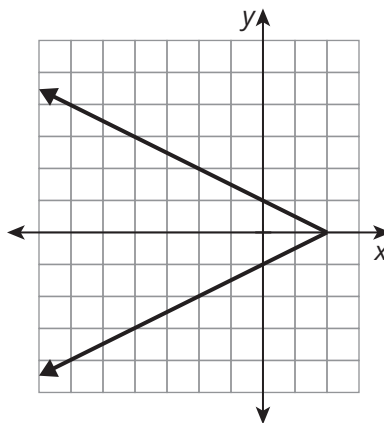
b

x	y
-10	50
-5	25
0	0
5	25

c



d



5 Identify the function family of a graph that is a parabola that has an absolute maximum or absolute minimum, and is symmetric.

6 Classify each function as increasing, decreasing, or constant. Explain your reasoning.

a $f(x) = -\frac{2}{3}x$

b $f(x) = -2.5$

8 Determine whether each function has an absolute maximum or absolute minimum. If the graph has neither an absolute maximum nor an absolute minimum, write *none*.

a $f(x) = \frac{1}{4}x$

b $f(x) = 2|x| - 4$

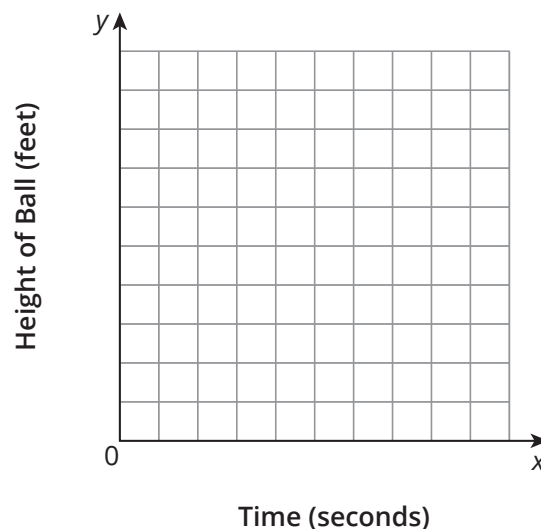
7 Classify each function as a linear function, a linear absolute value function, a quadratic function, or an exponential function. Explain your reasoning.

a $f(x) = 2x^2 + 4x - 3$

b $f(x) = 2^x - 3$

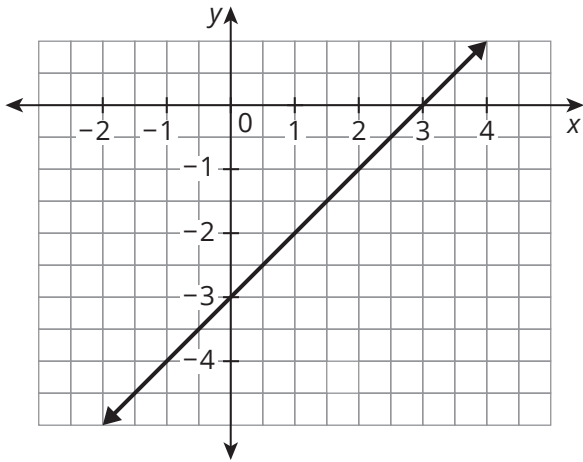
9 Sketch a graph of the given situation.

Markus is a golfer for his school's golf team. In one of his drives, the ball leaves the tee and is in the air for a few seconds. The ball reaches a maximum height of 75 feet off the ground. Then the ball lands on the green.

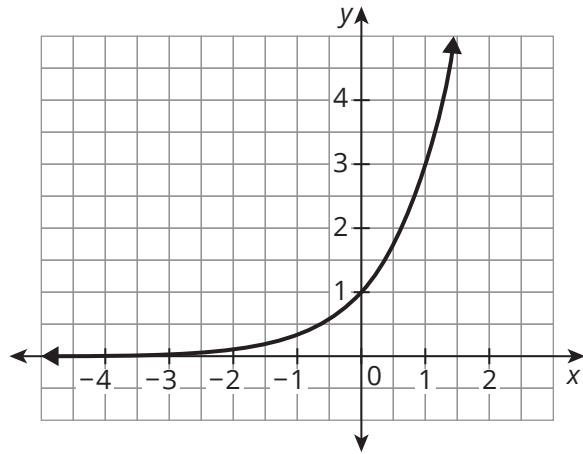


10 Match each function to its graph. Explain your reasoning.

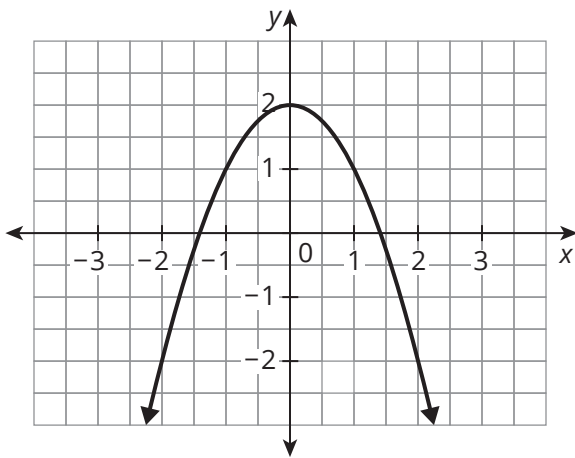
Graph A



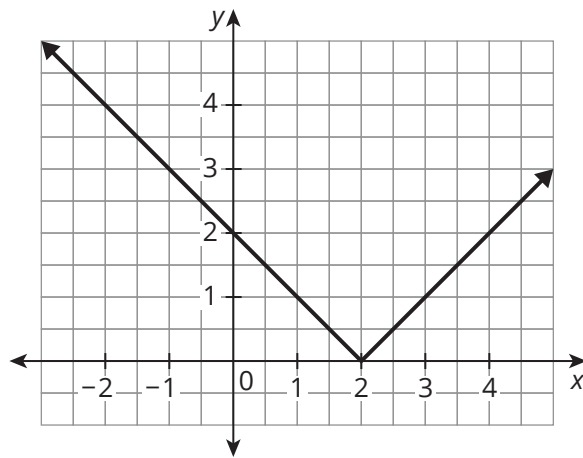
Graph B



Graph C



Graph D



a $f(x) = -x^2 + 2$

b $f(x) = 3^x$

c $f(x) = x - 3$

d $f(x) = |x - 2|$