

1.

Which is a linear function?

- a. $f(x) = x + 2$
- b. $f(x) = x^2$
- c. $f(x) = 2^x$
- d. $f(x) = |2x|$

2.

Grissom draws different sized spheres in a notebook. He knows there is a relationship between the volume of the sphere and the length of its diameter. What is the independent quantity in the situation?

- a. surface area of the sphere
- b. length of the diameter
- c. volume of the sphere
- d. number of spheres Grissom draws

3.

Kathy has different-sized soup cans that are in the shape of a cylinder. She knows there is a relationship between the surface area of each can and the length of its radius. What is the dependent quantity in the situation?

- a. volume of the soup can
- b. height of the cylinder
- c. length of the radius
- d. surface area of the soup can

4.

Which statement about the function $f(x) = |x + 3|$ is true?

- a. It has an absolute minimum.
- b. It has an absolute maximum.
- c. It has both an absolute minimum and an absolute maximum.
- d. It has neither an absolute minimum nor an absolute maximum.

5.

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.

6.

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

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.

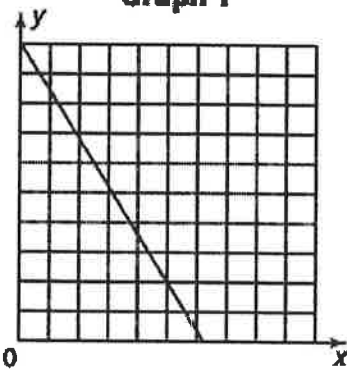
b. Mountain Hike

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

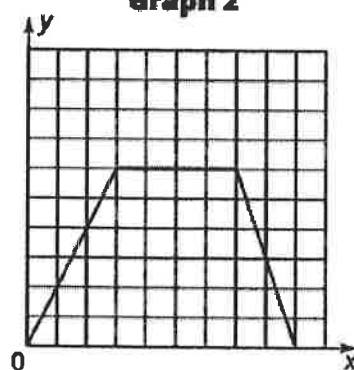
c. Car Value

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.

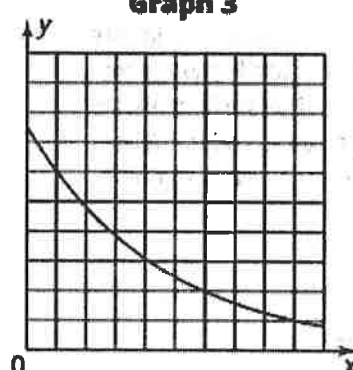
Graph 1



Graph 2



Graph 3



7.

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

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

b. $f(x) = -2.5$

8.

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

11.

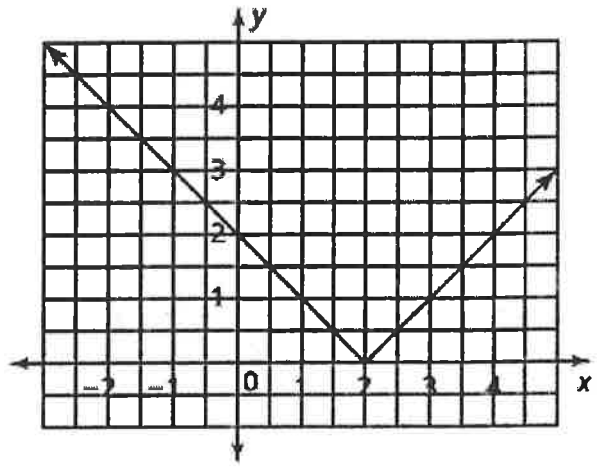
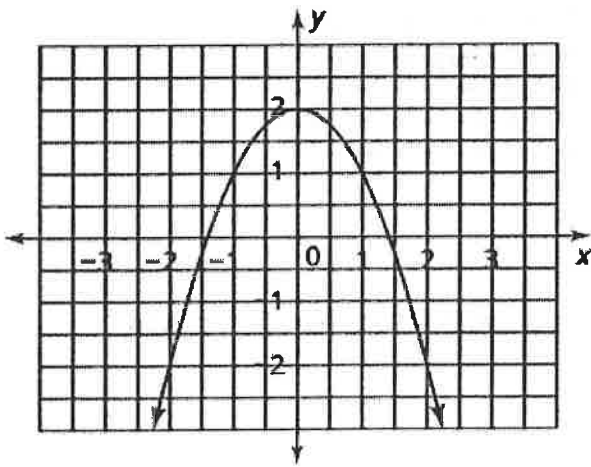
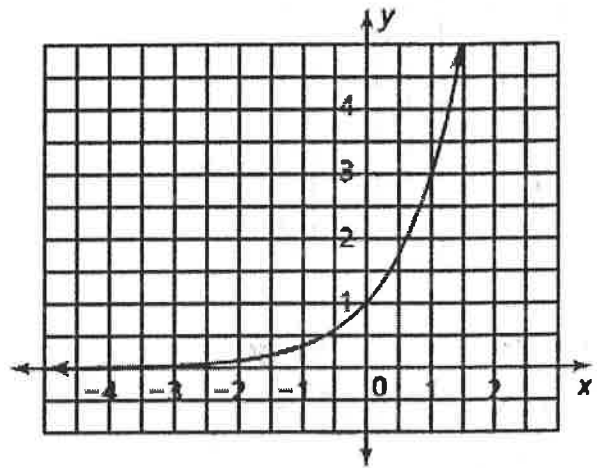
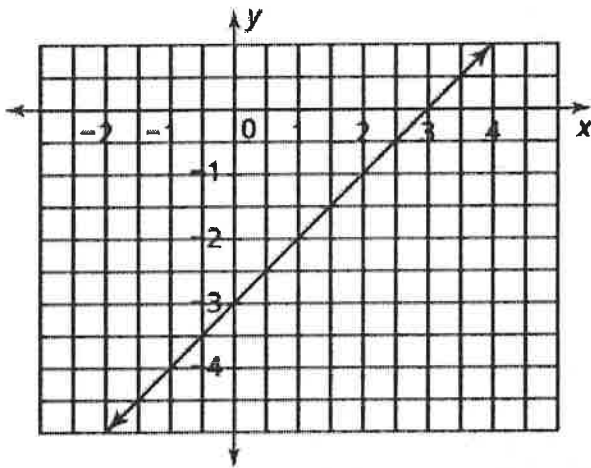
Match each function to its graph. Put the graph in the first blank and the domain/range in the second blank.

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

b. $f(x) = 3^x$ _____

c. $f(x) = x - 3$ _____

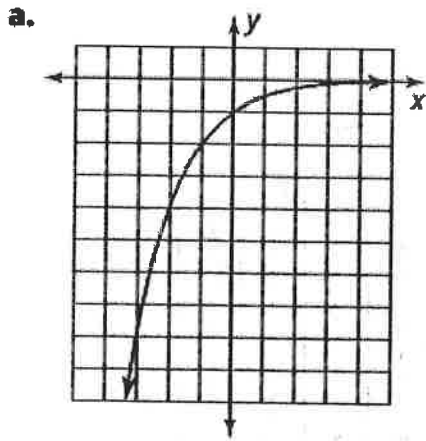
d. $f(x) = |x - 2|$ _____



1. Domain: All real numbers Range: All real numbers	2. Domain: All real numbers Range: $y \leq 2$
3. Domain: All real numbers Range: $y > 0$	4. Domain: All real numbers Range: $y \geq 0$

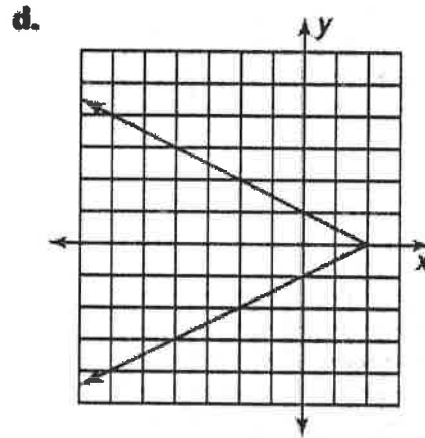
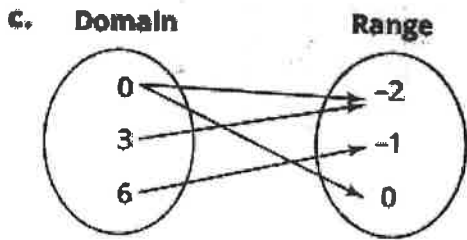
9.

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



b.

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



10.

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