Describing Graphs of Functions Worksheet

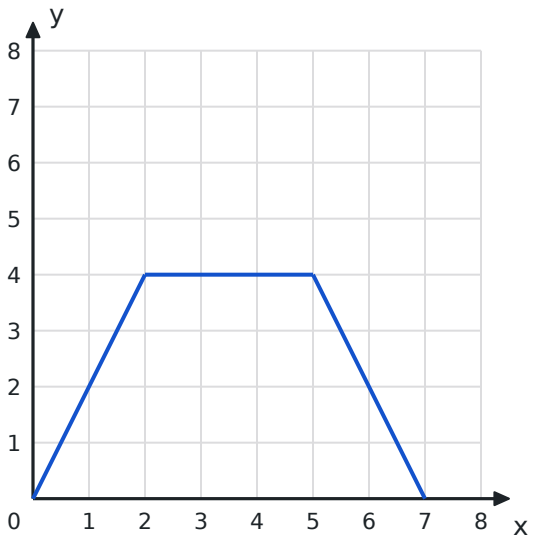
Grade 8 · Common Core 8.F.B.5

> Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

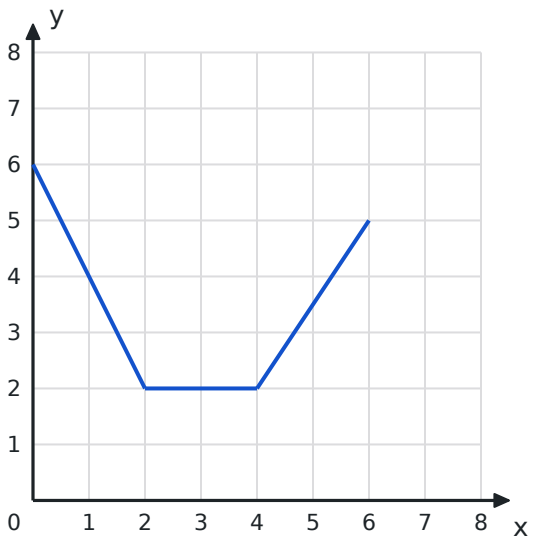
Practice

Builds the skill step by step.

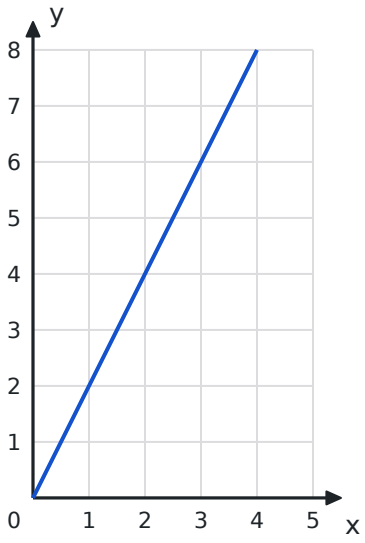
1. Over which interval of x is the function decreasing?



2. Over which interval of x is the function constant?



3. Which words describe the function shown on the graph?



A. Decreasing and linear

B. Increasing and linear

C. Constant

D. Increasing and nonlinear

4. Maya walks to school at a steady pace, stops at a friend's house for a few minutes, then walks the rest of the way at the same pace. Which describes the graph of her distance from home over time?

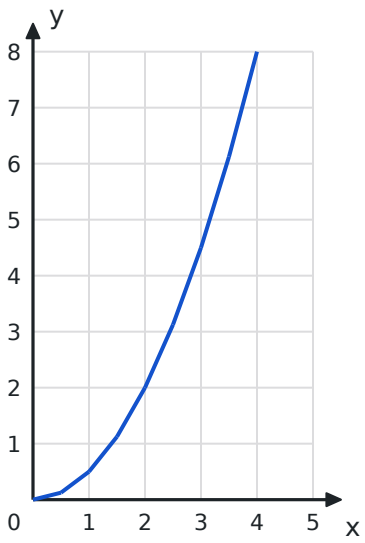
   A. Flat, then rises, then flat

   B. Rises, then falls, then rises

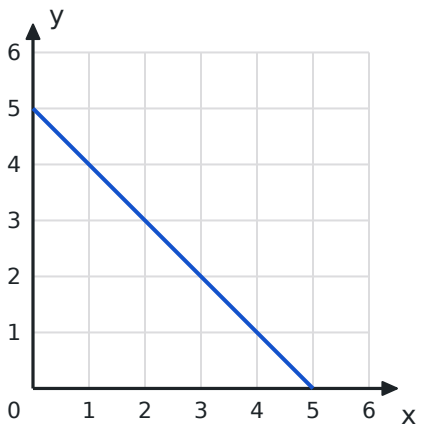
   C. Rises, then flat, then rises

   D. Rises, then flat, then falls

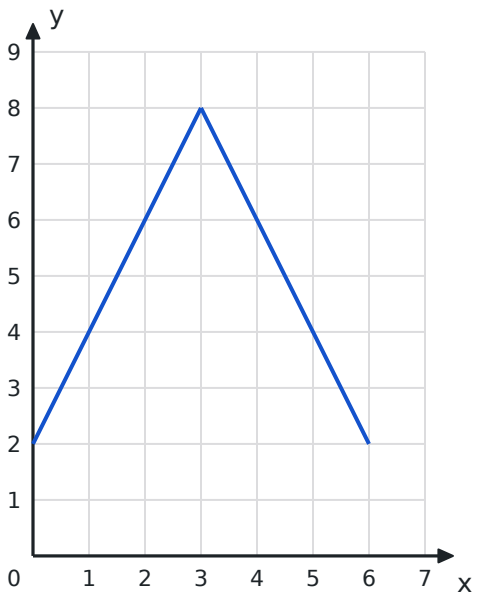
5. Is the function shown on the graph increasing or decreasing?



6. Is the function shown on the graph linear or nonlinear?



7. At what x-value does the function stop increasing and start decreasing?



8. Which situation matches a graph that decreases at a steady rate?

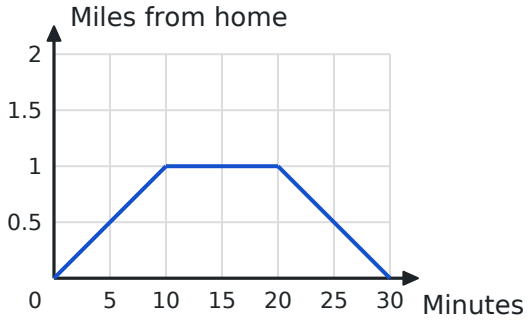
   A. The distance from home of a parked car

   B. The height of a growing plant

   C. The height of a ball thrown up into the air

   D. The height of a candle as it burns

9. The graph shows Ravi's distance from home, in miles, over 30 minutes. For how many minutes was Ravi not moving?



10. What does it mean for a function to be increasing on an interval?

    A. As x increases, y increases.

    B. As y increases, x decreases.

    C. The graph is above the x-axis.

    D. The graph is a straight line.

ALBERT

Name _____ Date _____

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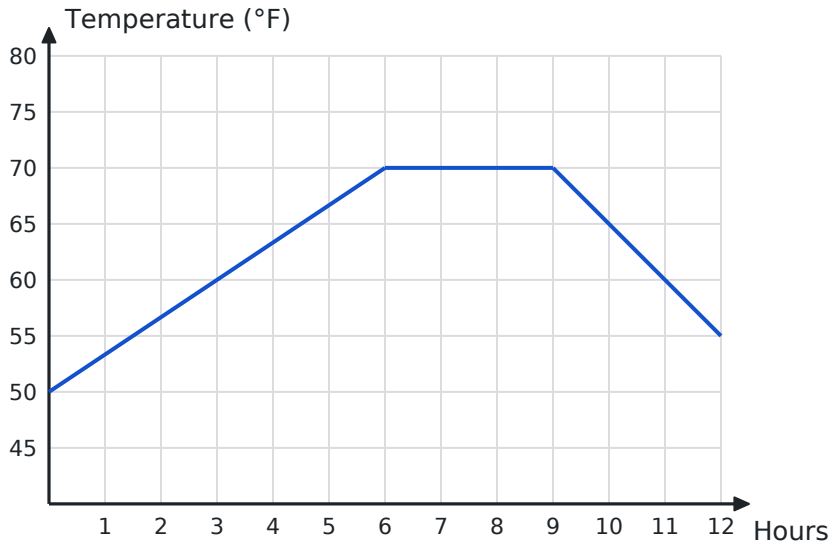
On Level

Grade-level practice.

1. The graph shows the temperature, in degrees Fahrenheit, over 12 hours. Over which interval did the temperature fall?



2. A bathtub fills with water. Then someone takes a bath, and the water level stays about the same. Then the drain is opened. Which describes the graph of the water level over time?

   A. Constant, then increasing, then decreasing

   B. Increasing, then constant, then decreasing

   C. Increasing, then decreasing, then constant

   D. Decreasing, then constant, then increasing

3. A car starts from a stop and keeps speeding up. Which describes the graph of its distance traveled over time?

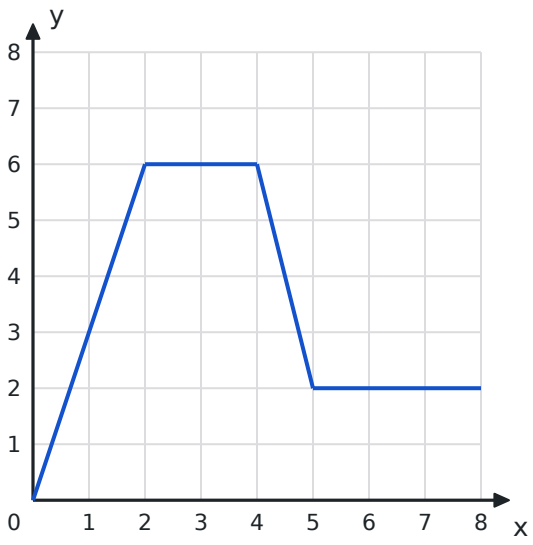
   A. Increasing and getting less steep

   B. Increasing at a constant rate

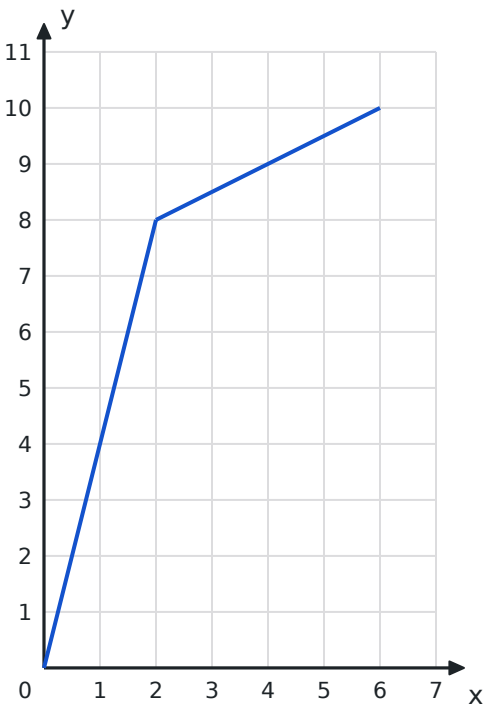
   C. Decreasing and getting steeper

   D. Increasing and getting steeper

4. On how many separate intervals is the function constant?



5. The function increases on both pieces of the graph. On which interval does it increase faster?



6. A ball is dropped from a window. Which describes the graph of its height over time until it hits the ground?

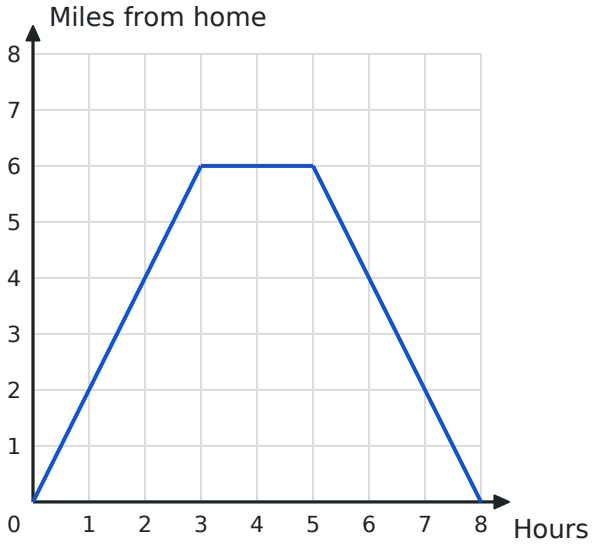
   A. Increasing, and rising faster as time passes

   B. Decreasing at a constant rate

   C. Decreasing, and falling faster as time passes

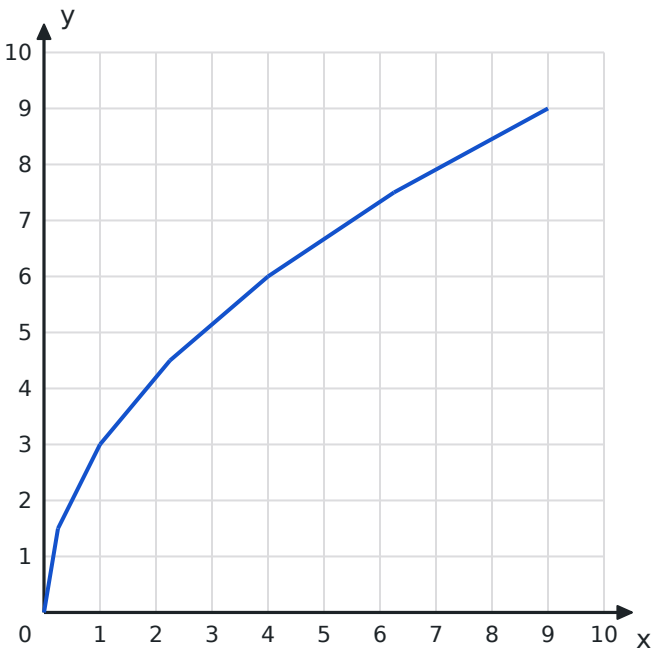
   D. Decreasing, and falling more slowly as time passes

7. The graph shows Ian's distance from home, in miles, during a bike ride. Describe what Ian does during the ride.



8. A tank is filled for 4 minutes, stays full for 6 minutes, then drains for 2 minutes. On a graph of the water in the tank over time, over which interval is the function constant?

9. Which words describe the function shown on the graph?



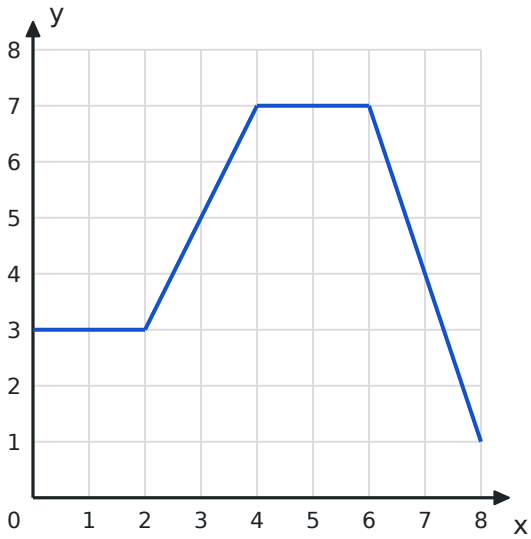
A. Increasing, and the rate slows down

B. Increasing at a constant rate

C. Increasing, and the rate speeds up

D. Decreasing, and the rate slows down

10. Over which interval of x is the function decreasing?



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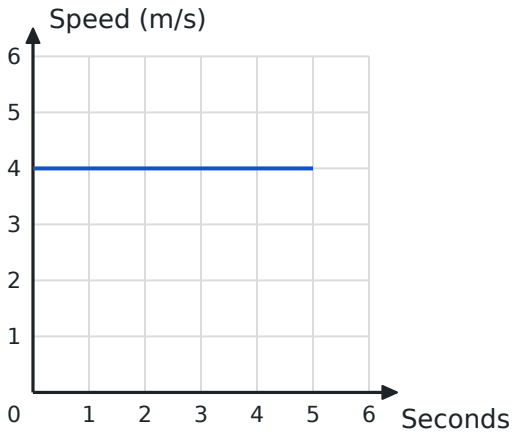
Challenge

Multi-step and word problems that stretch it.

1. The graph shows Leo's speed, in meters per second, over 5 seconds. What does it show?



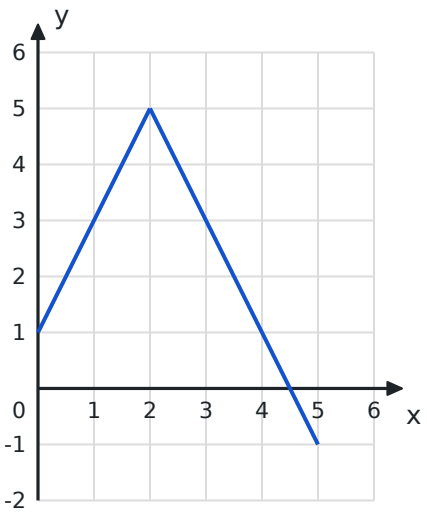
A. Leo moves at a steady 4 meters per second.

B. Leo is standing still.

C. Leo is speeding up.

D. Leo stays 4 meters from where he started.

2. What is the rate of change of the function on the interval from x = 2 to x = 5?



3. A graph of distance from home rises steeply from 0 to 2 hours, rises slowly from 2 to 6 hours, then falls steeply back to 0. Which story fits?

   A. Pat walks slowly away from home, then drives fast, then walks home.

   B. Pat stays home, then walks slowly away, then drives home.

   C. Pat drives fast on a highway, then walks slowly around a town, then drives straight home.

   D. Pat drives fast toward home, then rests, then drives away.

4. A function starts at (0, 1) and increases linearly with a rate of change of 2 until x = 3. It is constant for the next 2 units of x. Then it decreases linearly with a rate of change of −1 until y = 0. At what x-value does it reach y = 0?

5. A graph of a car's distance from home rises, stays flat, then rises again. Kai says the flat part means the car was driving on flat ground. What is the error?

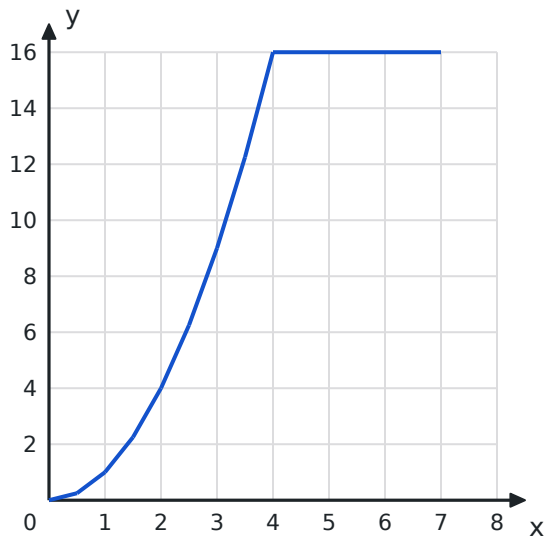
   A. A flat part means the car was heading back home.

   B. There is no error; the flat part shows flat ground.

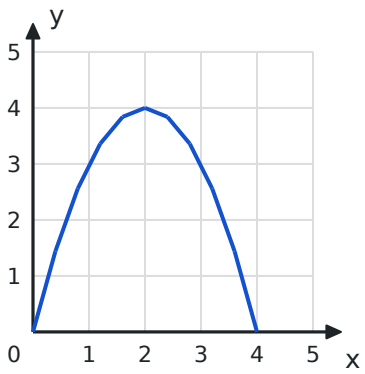
   C. A flat part means the car was driving fastest.

   D. A flat part means the distance from home did not change, so the car was stopped.

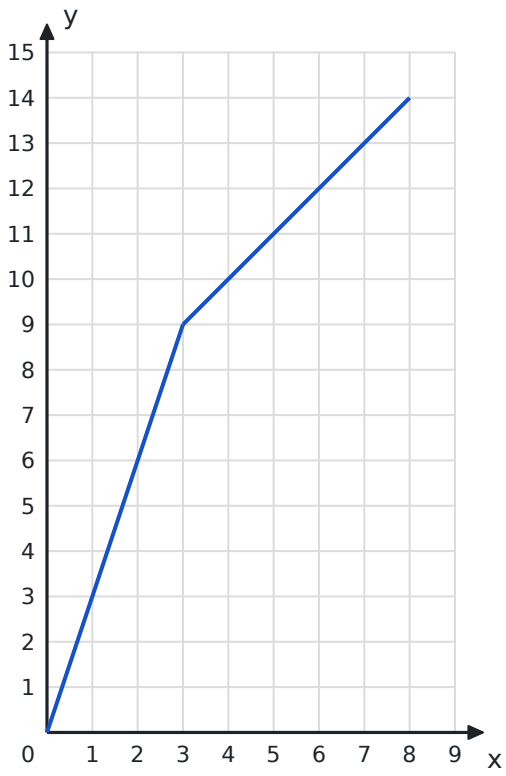
6. Is the function linear or nonlinear on the interval from x = 0 to x = 4?



7. The graph shows the height of a kicked ball over time. Describe the graph: where the height increases, where it decreases, and whether the function is linear.



8. How much greater is the rate of change on the first piece of the graph than on the second?



9. A function is made of three straight pieces. It decreases at a constant rate, then decreases more slowly at a constant rate, then is constant. Which list could give the rates of change of the three pieces, in order?

   A. $-1, -3, 0$

   B. $-3, -1, 0$

   C. $3, 1, 0$

   D. $-3, 0, -1$

10. Ana jogs 2 miles away from home in 20 minutes, rests for 10 minutes, then walks home in 40 minutes. On a graph of her distance from home over time, for how many minutes is the function decreasing?