

Student notes:

A graph is an effective way to show the relationship between two quantities. A constant rate of change is represented graphically by a straight line. The steepness of the line indicates the rate at which one quantity is changing in relation to the other.

A steeper line indicates a faster rate of vertical change on the red line than on the blue line. This change may indicate an increase or a decrease.

Faster Increase

Faster Decrease

A horizontal line means that there is no rate of change.

Every value on the horizontal axis is related to the same value on the vertical axis.

Not all relationships are represented by a straight line. A curve shows that the rate of change is not constant.

As quantity B increases, the increase in quantity A is gradual at first. It then becomes much greater.

As quantity B increases, the increase in quantity A slows until quantity A reaches a maximum value. Then, quantity A decreases.

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When comparing two quantities, straight lines are used to indicate a constant change in the relationship. Curves are used when the rate of change is not constant. Horizontal lines are used if one quantity is not changing relative to a change in the other quantity.

Constant Rate of Change

Rate of Change Is Not Constant

No Rate of Change

Your Turn

- The graph shows the speed of the boat that is pulling a wakeboarder. Describe what the boat is doing.
- Which graph best represents a person's height as the person ages? Explain your choice.

Graph A

Graph B

Graph C

Graph D

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Chapter 6 Section 1 | Graphs of Relations

Investigate Describing and Sketching Graphs

1. Work in pairs.

a) The graph shows the distance a rock climber is from the base of a cliff as time passes. Using the words *climbing*, *resting*, or *descending*, describe what the climber is doing during each segment shown. Explain your choice.

b) Is there more than one interpretation of the climber's actions during the times indicated by segments AB, CD, DE, and FG?

c) For any section that you listed as "climbing," how would you change the graph to show that the person is climbing faster? Explain your reasoning.

d) What would you add to the graph to show the climber's return to the bottom of the cliff?

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2. Work in pairs. Match each graph with a situation from the list. Explain your choice. Suggest titles for each axis to show the quantities being compared.

Graph A

Graph B

Graph C

Graph D

a) the temperature of a cup of hot chocolate over time
 b) a car accelerating to a constant speed
 c) the distance a person walks during a hike
 d) the height of a soccer ball kicked across a field

3. CBR Activity

Homework: Read the examples #1- 3 on pages 271-273. On pages 274-278, do questions #2, 3.

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Homework: Read the examples #1- 3, on pages 271-273. On pages 274-278, do questions #1-5, 10, 11, 15

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