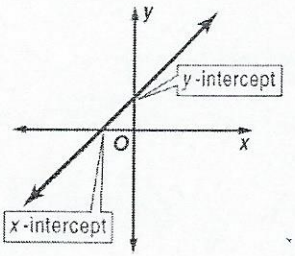
Swift - Day 4
Lesson 4

NAME _____ DATE _____ PERIOD Alg. I

1-8 Study Guide and Intervention

Interpreting Graphs of Functions

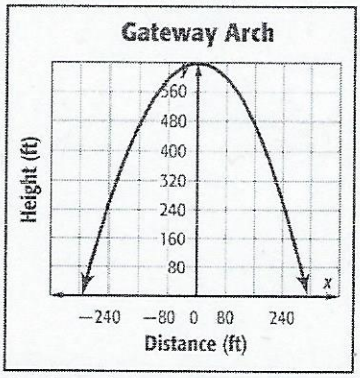
Interpret Intercepts and Symmetry The **intercepts** of a graph are points where the graph intersects an axis. The y-coordinate of the point at which the graph intersects the y-axis is called a ***y*-intercept.** Similarly, the x-coordinate of the point at which a graph intersects the x-axis is called an ***x*-intercept.**



A graph possesses **line symmetry** in a line if each half of the graph on either side of the line matches exactly

Example

ARCHITECTURE The graph shows a function that approximates the shape of the Gateway Arch, where x is the distance from the center point in feet and y is the height in feet. Identify the function as *linear* or *nonlinear*. Then estimate and interpret the intercepts, and describe and interpret any symmetry.



Linear or Nonlinear: Since the graph is a curve and not a line, the graph is nonlinear.
***y*-Intercept:** The graph intersects the y-axis at about (0, 640), so the y-intercept of the graph is about 640. This means that the height of the arch is 640 feet at the center point.
***x*-Intercept(s):** The graph intersects the x-axis at about (–320, 0) and (320, 0). So the x-intercepts are about –320 and 320. This means that the object touches the ground 320 feet to the left and right of the center point.
Symmetry: The right half of the graph is the mirror image of the left half in the y–axis. In the context of the situation, the symmetry of the graph tells you that the arch is symmetric. The height of the arch at any distance to the right of the center is the same as its height that same distance to the left.

Identify the function graphed as *linear* or *nonlinear*. Then estimate and interpret the intercepts of the graph and any symmetry.

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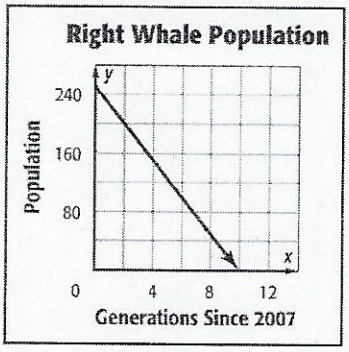

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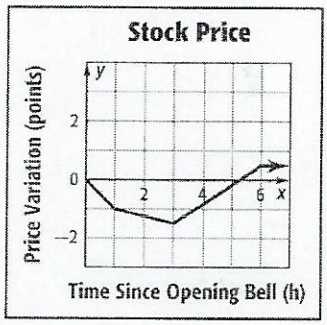

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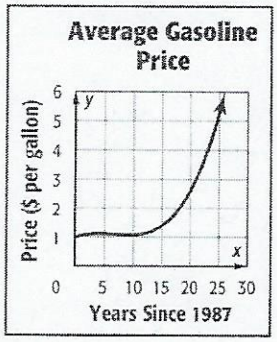

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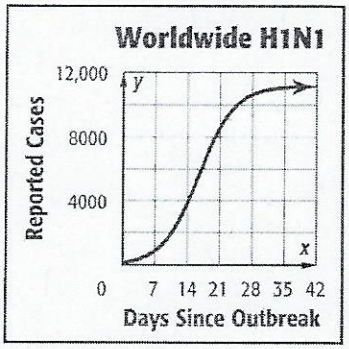
1-8 Study Guide and Intervention *(continued)*

Interpreting Graphs of Functions

Interpret Extrema and End Behavior Interpreting a graph also involves estimating and interpreting where the function is increasing, decreasing, positive, or negative, and where the function has any extreme values, either high or low.

Example

HEALTH The outbreak of the H1N1 virus can be modeled by the function graphed at the right. Estimate and interpret where the function is positive, negative, increasing, and decreasing, the x-coordinates of any relative extrema, and the end behavior of the graph.



Positive: for x between 0 and 42

Negative: no parts of domain

This means that the number of reported cases was always positive. This is reasonable because a negative number of cases cannot exist in the context of the situation.

Increasing: for x between 0 and 42 **Decreasing:** no parts of domain

The number of reported cases increased each day from the first day of the outbreak.

Relative Maximum: at about $x = 42$ **Relative Minimum:** at $x = 0$

The extrema of the graph indicate that the number of reported cases peaked at about day 42.

End Behavior: As x increases, y appears to approach 11,000. As x decreases, y decreases. The end behavior of the graph indicates a maximum number of reported cases of 11,000.

Estimate and interpret where the function is positive, negative, increasing, and decreasing, the x-coordinate of any relative extrema, and the end behavior of the graph.

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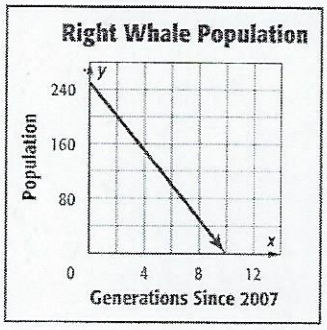

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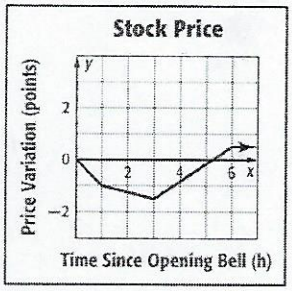

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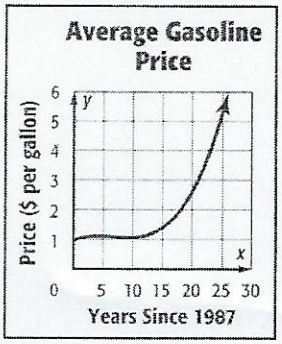

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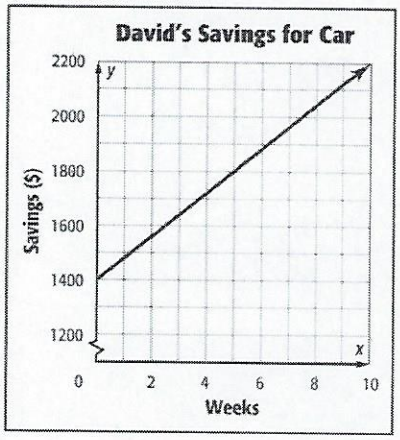
1-8 Skills Practice

Interpreting Graphs of Functions

Identify the function graphed as *linear* or *nonlinear*. Then estimate and interpret the intercepts of the graph, any symmetry, where the function is positive, negative, increasing, and decreasing, the x-coordinate of any relative extrema, and the end behavior of the graph.

1.



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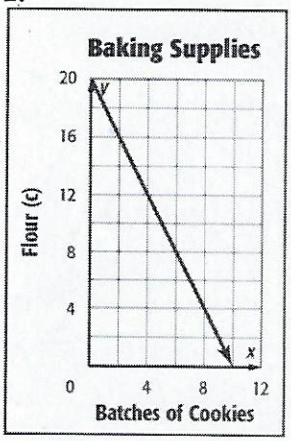

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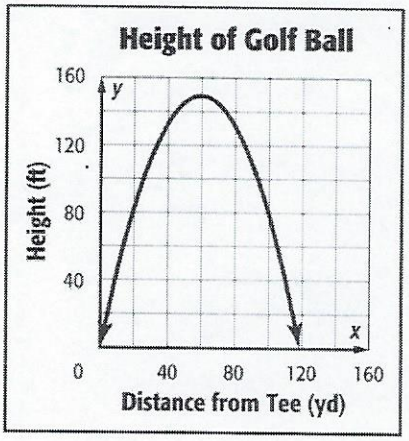

4.