1-8 Interpreting Graphs of Functions

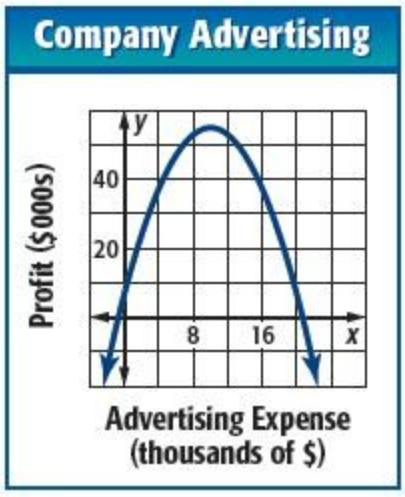
ORGANIZE IDEAS Identify the function graphed as *linear* or *nonlinear*. Then estimate and interpret the intercepts of the graph, any symmetry, where the function is positive, negative, increasing, and decreasing, the *x*-coordinate of any relative extrema, and the end behavior of the graph.

4.

ANSWER:

Linear; the *y*-intercept is about –400, so the mowing service has a start-up cost of about $400. The *x*-intercept is about 4, so after about 4 weeks, the profit will be $0. The graph has no line symmetry. The profits will be in the negative until after about 4 weeks, and then will be positive for all time afterwards. The profits are constantly increasing. There are no extrema. As the number of weeks increases, the profits will increase.

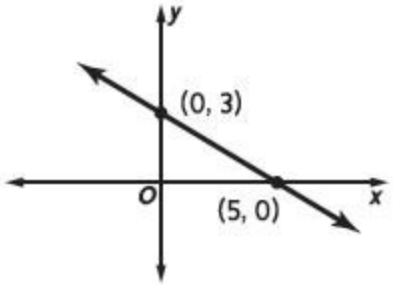
6.



ANSWER:

Nonlinear; the *y*-intercept is about 5000, so the company has a profit of about $5000 without spending any money on advertising. The *x*-intercepts are about -1 and about 21, so the company will make a profit of $0 if they spend $21,000 on advertising. Spending between $0 and $10,000 on advertising will produce the same profits as spending between $10,000 and $20,000. The company will make a profit if they spend between $0 and $21,000. If they spend more than $21,000 on advertising, they will lose money. The profits will increase until the company spends about $10,000, and then the profits will decrease for any amount greater than $10,000. Spending about $10,000 will produce the greatest profit. As more money is spent on advertising, the profits will decrease so that the company is losing money.

23. Which of the following best describes the graph?



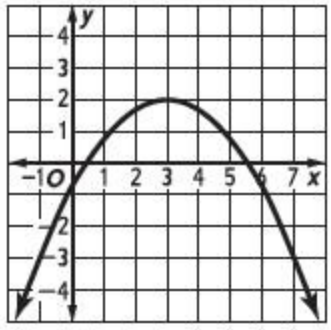
A The x-intercept is 3; the y-intercept is 5; the graph is positive for $x < 5$; the graph is negative for $x > 5$.
B The x-intercept is 5; the y-intercept is 3; the graph is positive for $x < 5$; the graph is negative for $x > 5$.
C The x-intercept is 5; the y-intercept is 3; the graph is positive for $x > 5$; the graph is negative for $x < 5$.
D The x-intercept is 5; the y-intercept is 3; the graph is positive for $x > 0$; the graph is negative for $x < 0$.

ANSWER:
B

24. **GRIDDABLE** Thomas graphs the function $y = 3(x - 6)^2$. What is the x-intercept of the function?

ANSWER:
6

25. Which statement best describes the graph shown.



F The graph is linear.
G The graph is nonlinear.
H There are two y-intercepts.
J The graph is increasing.

ANSWER:
G