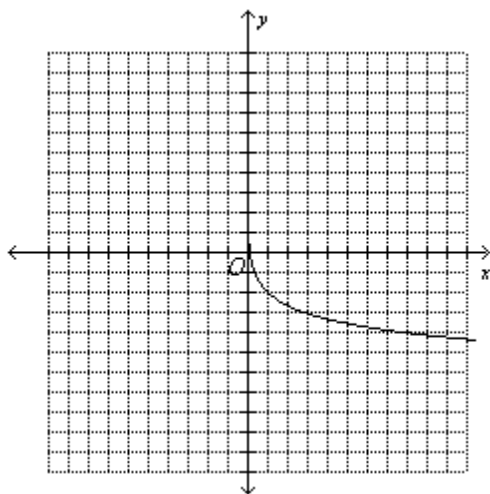


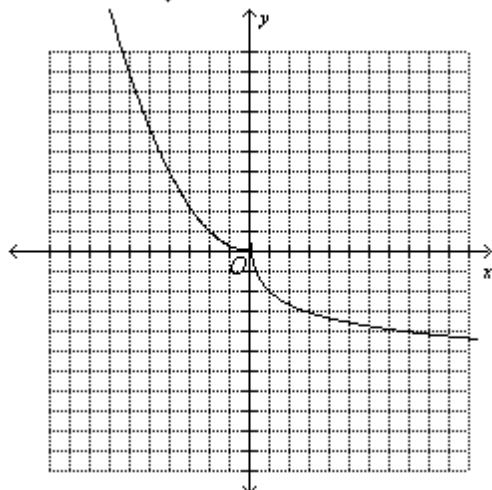
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Indicate the answer choice that best completes the statement or answers the question.

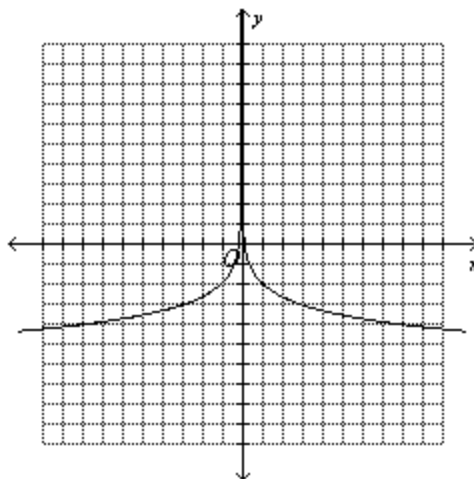
1. The graph below is a portion of a complete graph. Which graph below is the complete graph assuming it is an even function?



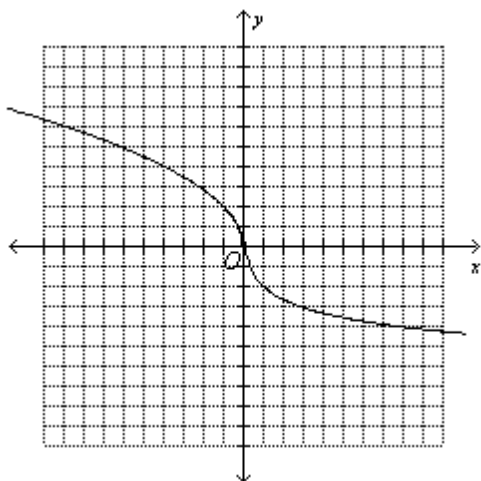
a.



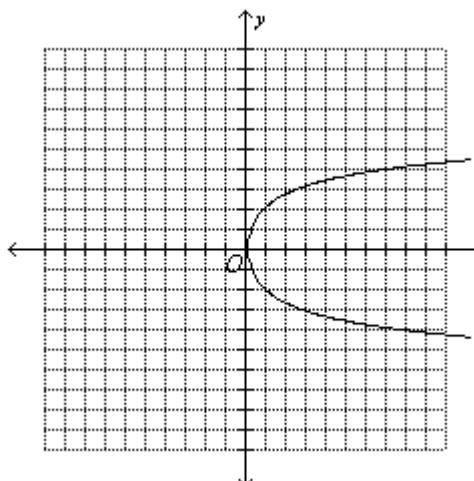
b.



c.



d.



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2. Which statement is true for the graph of $f(x) = 2x^3 - 6x^2 - 48x + 24$?

- a. $(4, -140)$ is a relative minimum; $(-2, 77)$ is a relative maximum
- b. $(4, -136)$ is a relative minimum; $(-2, 80)$ is a relative maximum
- c. $(-2, 80)$ is a relative minimum; $(4, -136)$ is a relative maximum
- d. $(-2, 77)$ is a relative minimum; $(4, -140)$ is a relative maximum

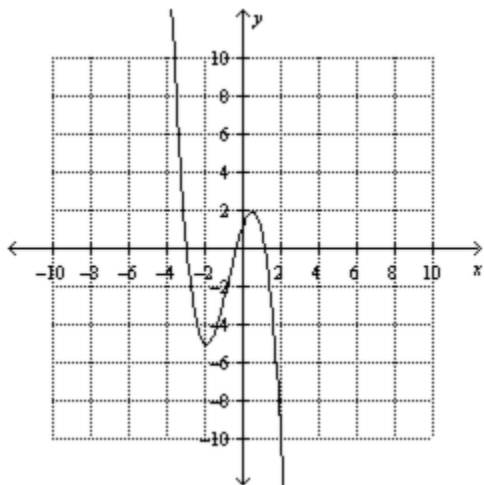
3. Which statement best describes how a graph of $y = 3|x|$ is related to the parent graph?

- a. The graph is stretched vertically.
- b. The graph is stretched horizontally.
- c. The graph is shrunk vertically.
- d. The graph is shrunk horizontally.

4. In a race between 18 people, how many ways can the top 5 finishers be arranged?

- a. 1,028,160 b. 8,568
- c. 742,560 d. 73,440

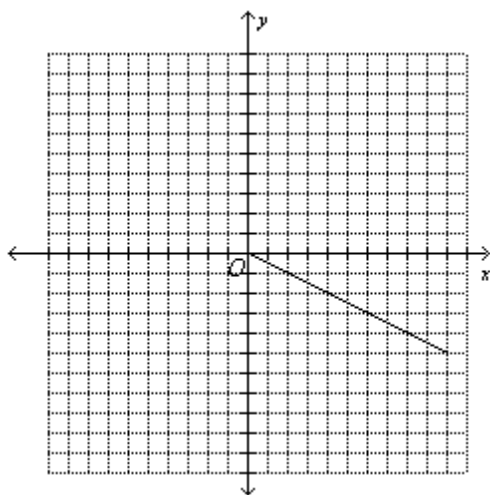
5. Use the graph of $f(x)$ to estimate $f(-1)$.



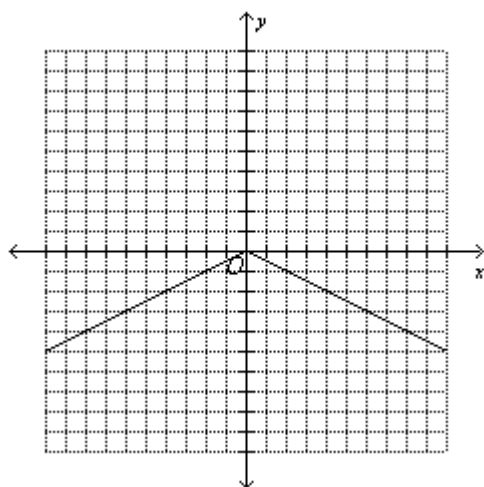
- a. $f(-1) = -3$ b. $f(-1) = -4$
- c. $f(-1) = -2$ d. $f(-1) = 3$

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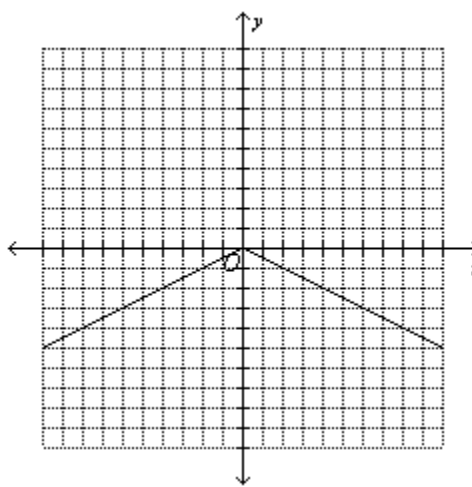
6. The graph below is a portion of a complete graph. Which graph below is the complete graph assuming it is an even function?



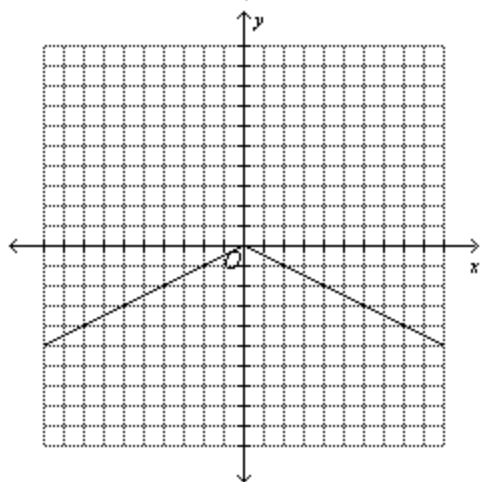
a.



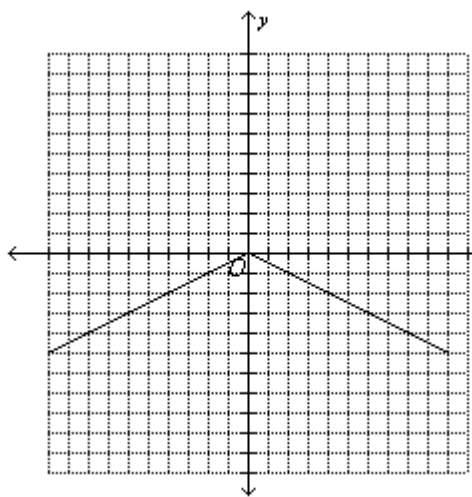
b.



c.



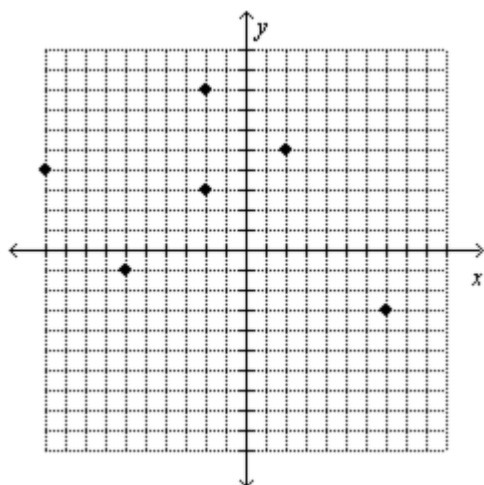
d.



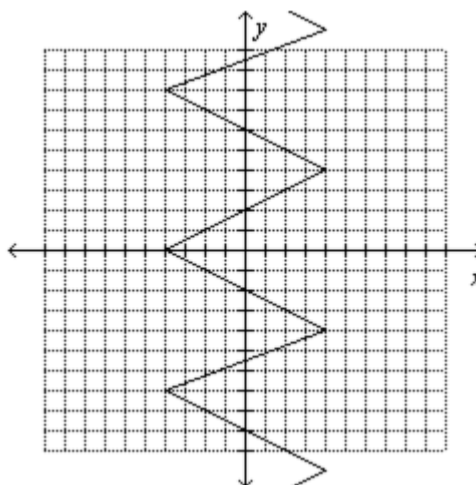
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7. Which of the following graphs is a function?

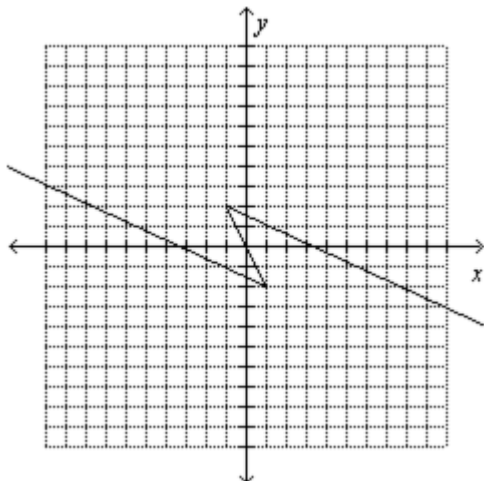
a.



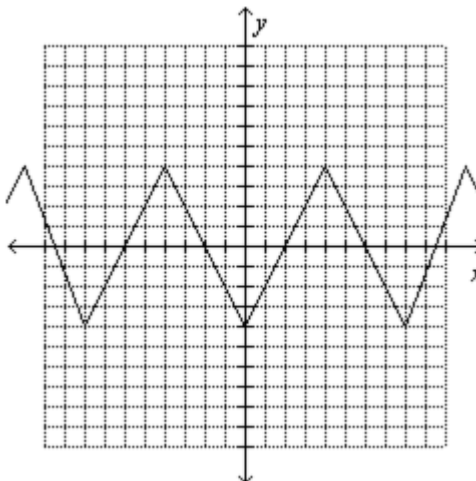
b.



c.

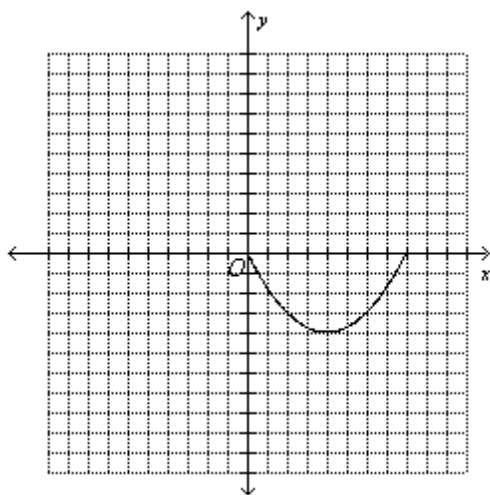


d.

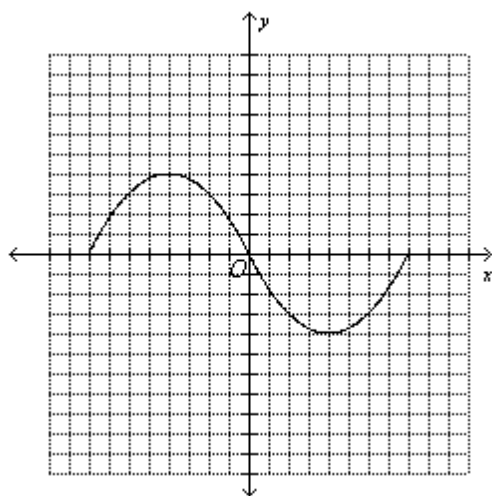


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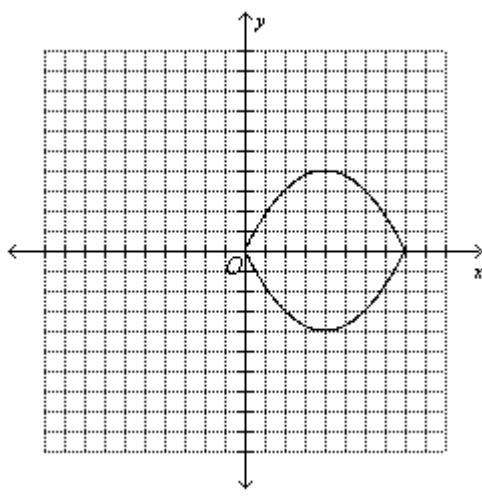
8. The graph below is a portion of a complete graph. Which graph below is the complete graph assuming it is an even function?



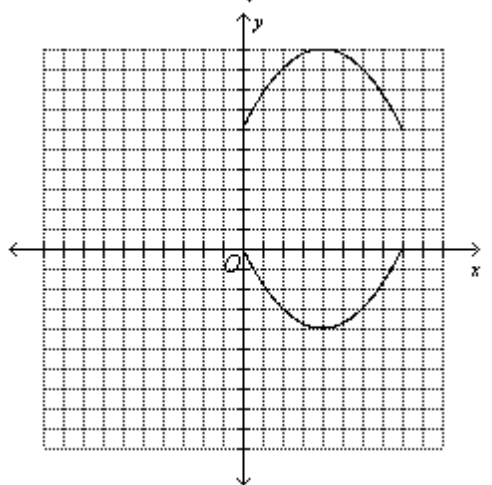
a.



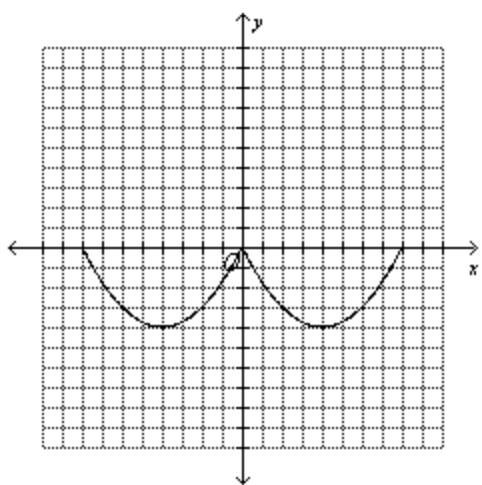
b.



c.



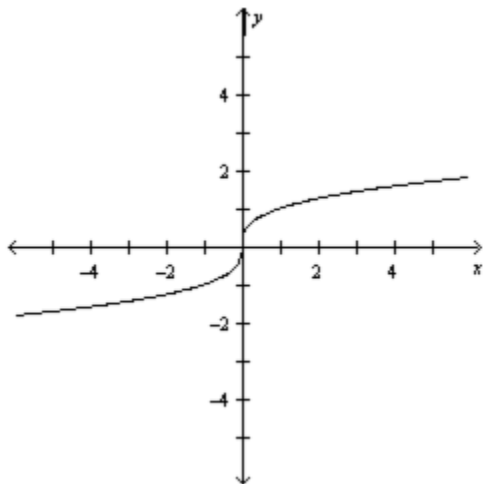
d.



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Estimate and classify the critical points for the graph of each function.

9.



- a. (0, 0), maximum
- b. (0, 0), minimum
- c. (0, 0), point of inflection
- d. no critical points

10. A corporate jet originally cost \$17,550,000. If its value depreciates by 5 percent per year, what will its value be after 10 years?

- a. \$10,507,833.28 b. \$7,042,166.72
- c. \$8,775,000 d. \$10,774,177.60

11. Solve.

$$\frac{x+3}{x-5} = \frac{x+7}{x-9}$$

- a. 1 b. 8
- c. -5 d. 2

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12. As automobiles age, the average miles traveled per gallon decreases. Determine the regression equation that best models the data.

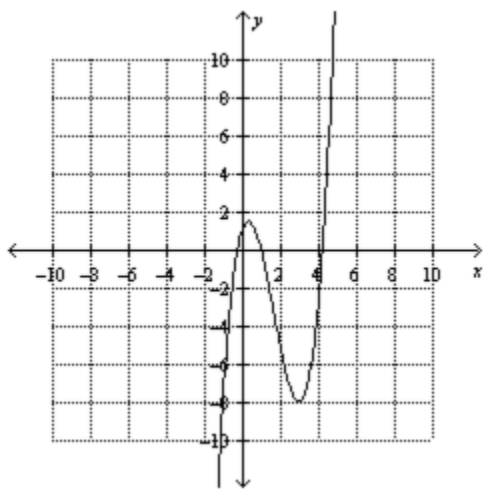
Age (years)	MPG
1	35
3	34
5	33
7	31
9	28
11	26
13	23
15	18

- a. power b. logarithmic
c. quadratic d. exponential

13. Find the exact solution of $x^2 - 5x = 36$ by using the Quadratic Formula.

- a. -8, 18 b. -9, 4
c. 36, 41 d. -4, 9

14. Use the graph of $f(x)$ to estimate $f(3)$.



- a. $f(3) = -9$ b. $f(3) = -8$
c. $f(3) = 8$ d. $f(3) = -7$

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15. Solve $\log_6 x = 2$

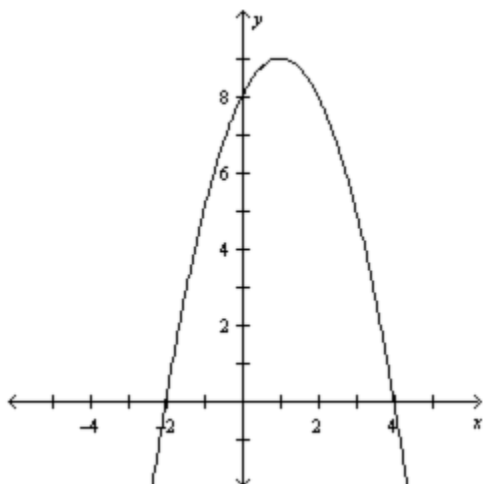
- a. 36 b. 12
c. 6 d. 64

16. $\frac{2y+1}{5} - \frac{2+7y}{15} > \frac{2}{3}$

- a. $y > -9$ b. $y < -9$
c. $y > 0$ d. $y > 0$ or $y < -9$

Estimate and classify the critical points for the graph of each function.

17.



- a. $(-2, 0)$, minimum; $(0, 8)$, maximum; $(4, 0)$, minimum
b. $(-2, 0)$, minimum; $(0, 8)$, point of inflection; $(1, 9)$, maximum; $(4, 0)$, minimum
c. $(1, 9)$, point of inflection
d. $(1, 9)$, maximum

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18. State the domain of $f \circ g$. Then find $f \circ g$, including any additional restrictions necessary on the domain of the composition.

$$f(x) = \frac{-9}{x}$$

$$g(x) = \sqrt{x-1}$$

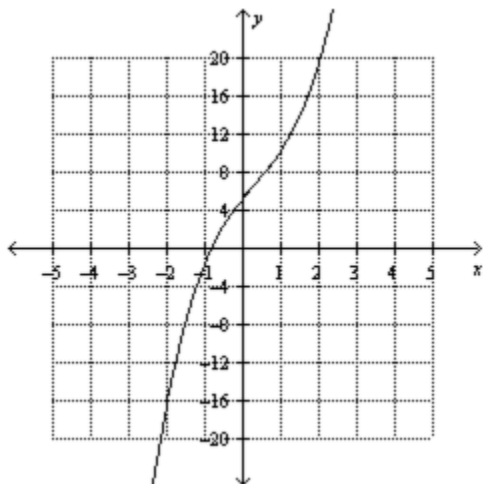
a. $D: x > 1; (f \circ g)(x) = \frac{-9}{\sqrt{x-1}}$

b. $D: x \geq 1; (f \circ g)(x) = \frac{-9}{\sqrt{x-1}}$

c. $D: x \neq 0; (f \circ g)(x) = \sqrt{\frac{-9}{x} - 1}$

d. $D: x \neq 0; (f \circ g)(x) = \frac{-9}{\sqrt{x-1}}$

19. Describe the end behavior of the graph.



a. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$

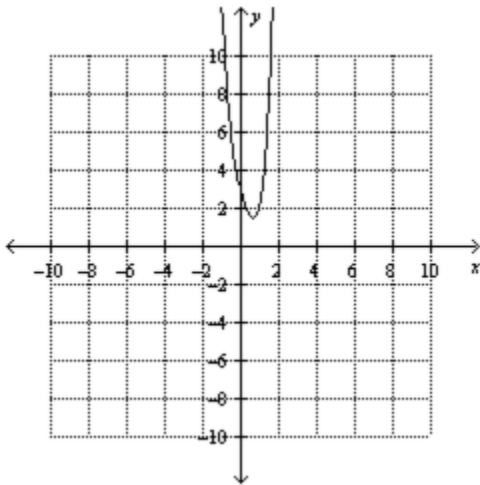
b. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

c. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$

d. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

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20. Use the graph of $f(x)$ to estimate $f(1)$.



- a. $f(1) = 3$ b. $f(1) = 2$
 c. $f(1) = -2$ d. $f(1) = 1$

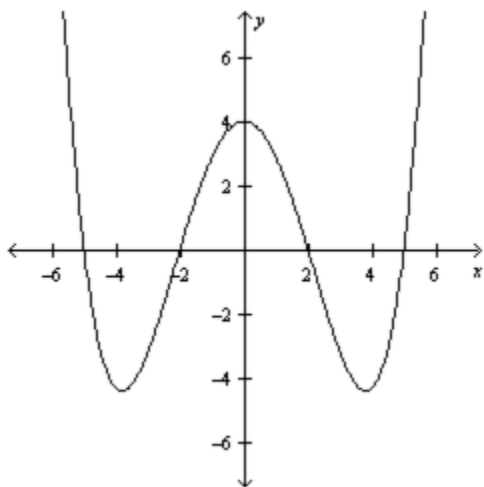
21. Find $\begin{bmatrix} 4 & 5 \\ -3 & -6 \end{bmatrix} + \frac{1}{2} \begin{bmatrix} 0 & 6 \\ -6 & -4 \end{bmatrix}$.

- a. $\begin{bmatrix} 2 & 5.5 \\ -4.5 & -5 \end{bmatrix}$ b. $\begin{bmatrix} 4 & 8 \\ -9 & -10 \end{bmatrix}$
 c. $\begin{bmatrix} 4 & 8 \\ -6 & -8 \end{bmatrix}$ d. $\begin{bmatrix} 2 & 8.5 \\ -7.5 & -7 \end{bmatrix}$

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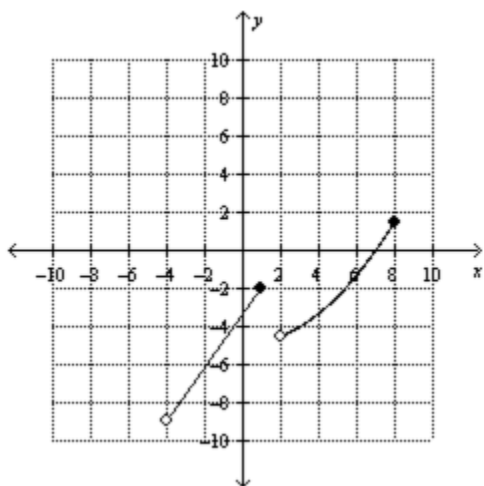
Estimate and classify the critical points for the graph of each function.

22.



- a. $(-4, -4.5)$, minimum; $(0, 4)$, maximum; $(4, -4.5)$, minimum
- b. $(-4, -4.5)$, minimum; $(0, 4)$, point of inflection; $(4, -4.5)$, minimum
- c. $(-4, -4.5)$, minimum; $(-2, 0)$, point of inflection; $(0, 4)$, maximum; $(2, 0)$, point of inflection; $(4, -4.5)$, minimum
- d. no critical points

23. Use the graph below to find the domain and range.



- a. D: $(-4, 1]$, $(2, 8]$
R: $(-9, 1.4]$
- b. D: $[-4, 1]$, $[2, 8]$
R: $[-9, 1.4]$
- c. D: $(-4, 1)$, $(2, 8)$
R: $(-9, 1.4)$
- d. D: $(-4, 8]$
R: $(-9, 1.4]$

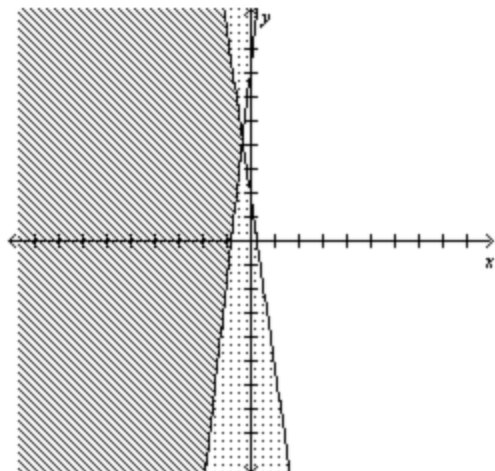
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24. Solve the system of inequalities by graphing.

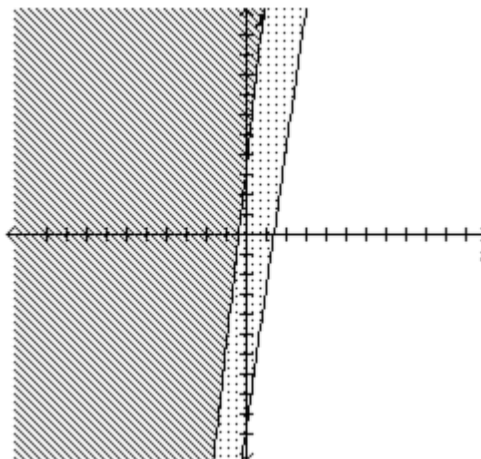
$$y \leq -7x - 2$$

$$y \geq 9x + 7$$

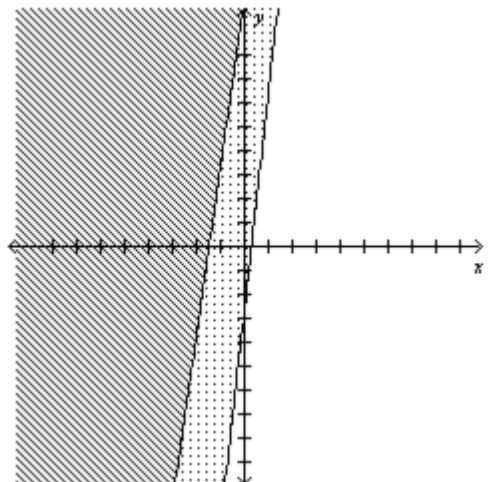
a.



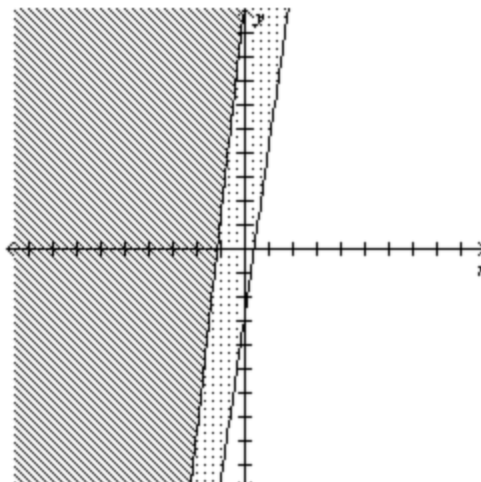
b.



c.



d.



Evaluate each expression.

25. $6^{\log_6 1.5}$

a. 6

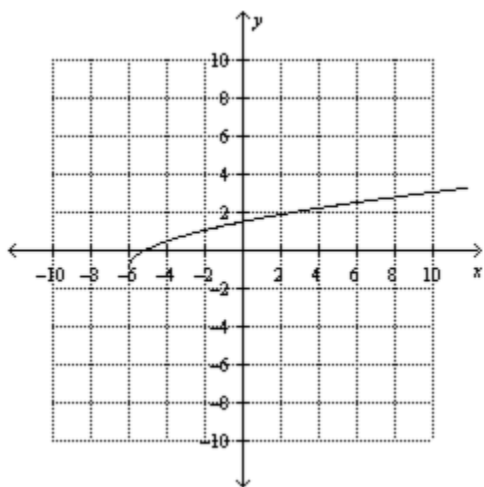
b. $6^{1.5}$

c. 1.5^6

d. 1.5

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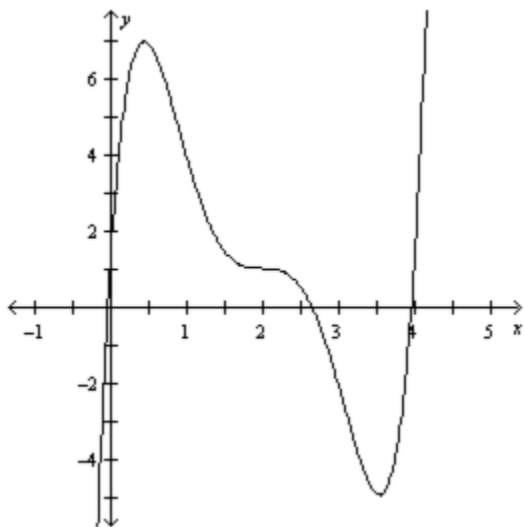
26. Use the graph below to identify the y-intercept and zeros.



- a. y-intercept: 1.45
zero: -7
- b. y-intercept: 1.45
zero: -5 No zeros
- c. y-intercept: 1.45
zeros: -5 and -7
- d. y-intercept: -5 No y-intercept
zero: 1.45

Estimate and classify the critical points for the graph of each function.

27.



- a. (0.5, 7), minimum; (2, 1), point of inflection; (3.5, -5), maximum
- b. (0.5, 7), maximum; (2, 1), point of inflection; (3.5, -5), minimum
- c. (0.5, 7), maximum; (3.5, -5), minimum
- d. no critical points

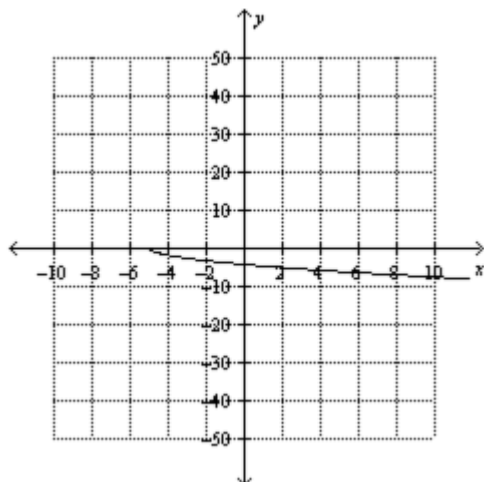
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28. Determine whether the graph of $5xy = 9$ is odd or even.

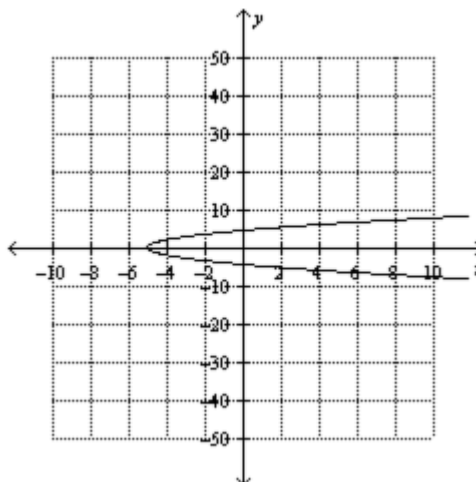
- a. neither b. odd
c. even d. both

29. Graph $f(x) = 2\sqrt{x+5}$.

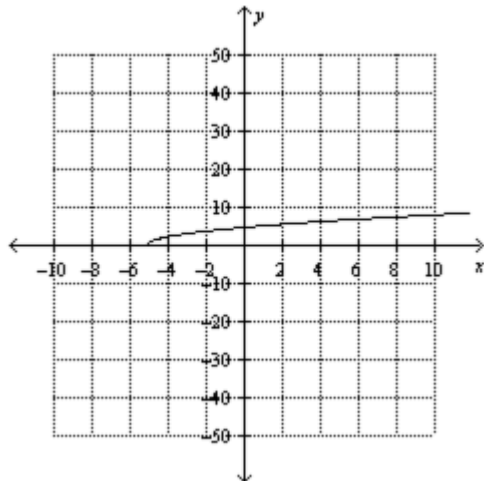
a.



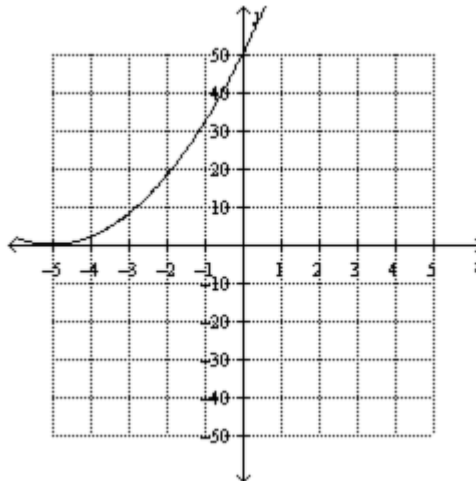
b.



c.



d.



30. Simplify the expression $\frac{8 - 8i\sqrt{5}}{6 + 2i\sqrt{5}}$ by using complex conjugates to write quotients of complex numbers in standard form.

- a. $-\frac{4}{7} - \frac{56}{23}i\sqrt{5}$ b. $\frac{16}{23} + \frac{56}{23}i\sqrt{5}$
c. $-\frac{4}{7} - \frac{8}{7}i\sqrt{5}$ d. $\frac{16}{23} + \frac{8}{7}i\sqrt{5}$

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