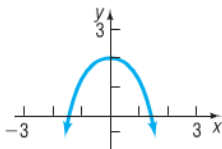


Do this homework on a separate sheet of paper!

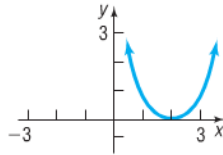
In problems 1-12, match the graphs to one of the following functions:

- | | | | |
|--------------------|---------------------|------------------|-------------------|
| A. $y = x^2 + 2$ | B. $y = -x^2 + 2$ | C. $y = x + 2$ | D. $y = - x + 2$ |
| E. $y = (x - 2)^2$ | F. $y = -(x + 2)^2$ | G. $y = x - 2 $ | H. $y = - x + 2 $ |
| I. $y = 2x^2$ | J. $y = -2x^2$ | K. $y = 2 x $ | L. $y = -2 x $ |

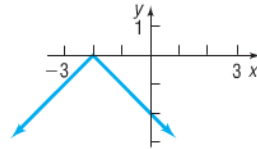
1.



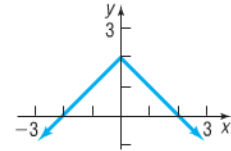
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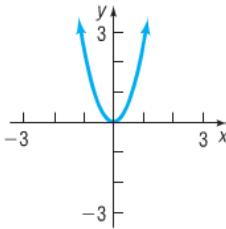
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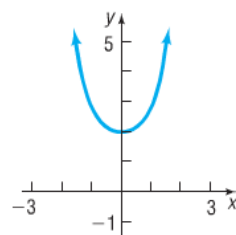
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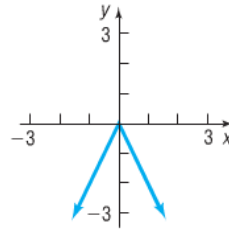
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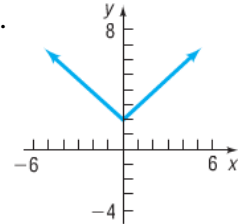
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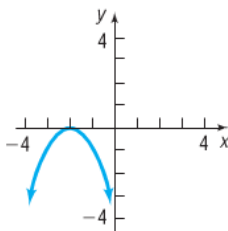
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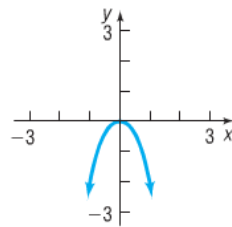
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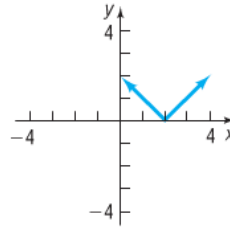
9.



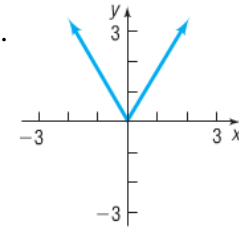
10.



11.



12.



Describe how the graph of $y = x^2$ can be transformed to the graph of the given equation.

- | | |
|-------------------------|-----------------------|
| 13. $y = x^2 - 3$ | 14. $y = (x + 4)^2$ |
| 15. $y = (x - 1)^2 + 3$ | 16. $y = (100 - x)^2$ |
| 17. $y = -5(x - 8)^2$ | 18. $y = -(4x)^2 + 7$ |

Find the function that is finally graphed after each of the following transformations is applied to the graph of $y = \sqrt{x}$ in the order stated.

19. (1) Shift up 2 units
 (2) Reflect about the x -axis
 (3) Reflect about the y -axis
20. (1) Vertical stretch by a factor of 2
 (2) Reflect about the y -axis
 (3) Shift left 3 units
21. (1) Vertical compression by a factor of $1/3$
 (2) Shift right 4 units
 (3) Reflect around the y -axis

Graph each function using transformations. Draw and label the parent graph and all intermediate stages. Show at least three key points. Find the domain and range of the final function. Blank graphs are on last page.

22. $f(x) = -x^2 - 2$

23. $f(x) = \frac{1}{3}|x-1| + 3$

24. $f(x) = \sqrt{-x} + 2$

25. $f(x) = -(x+1)^3 - 1$

26. $f(x) = -3\sqrt[3]{2x}$

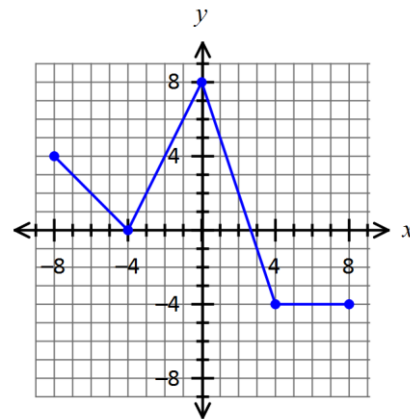
27. $f(x) = \frac{2}{x-1} - 2$

28. Suppose that the x -intercepts of the graph of $y = f(x)$ are -2 and 3 .

- What are the x -intercepts of the graph of $y = f(x+2)$?
- What are the x -intercepts of the graph of $y = f(x-2)$?
- What are the x -intercepts of the graph of $y = 4f(x)$?
- What are the x -intercepts of the graph of $y = f(-x)$?

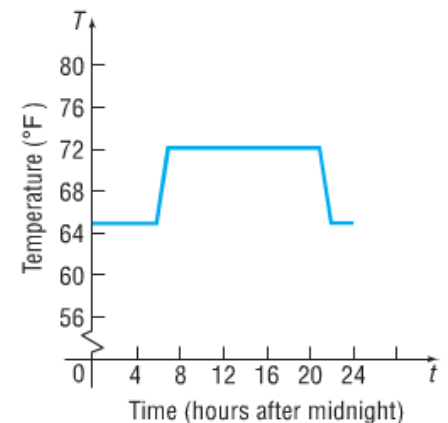
29. The graph of a function f is illustrated to the right. Use the graph as the first step toward graphing each of the following functions (on separate graph)

- $F(x) = f(x) + 2$
- $G(x) = f(x+2)$
- $P(x) = -f(x)$
- $H(x) = f(-x)$
- $Q(x) = \frac{1}{2}f(x)$
- $R(x) = f(2x)$
- $T(x) = f(x-3) - 1$



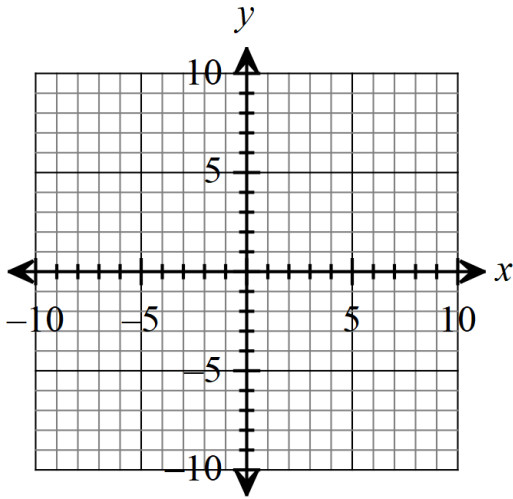
30. Energy conservation experts estimate that homeowners can save 5% to 10% on winter heating bills by programming their thermostats 5 to 10 degrees lower while sleeping. In the given graph, the temperature T (in degrees Fahrenheit) of a home is given as a function of time t (in hours after midnight) over a 24-hour period.

- At what temperature is the thermostat set during daytime hours? At what temperature is the thermostat set overnight?
- The homeowner reprograms the thermostat to $y = T(t) - 2$. Explain how this will affect the temperature in the house.
- The homeowner reprograms the thermostat to $y = T(t+1)$. Explain how this will affect the temperature in the house.

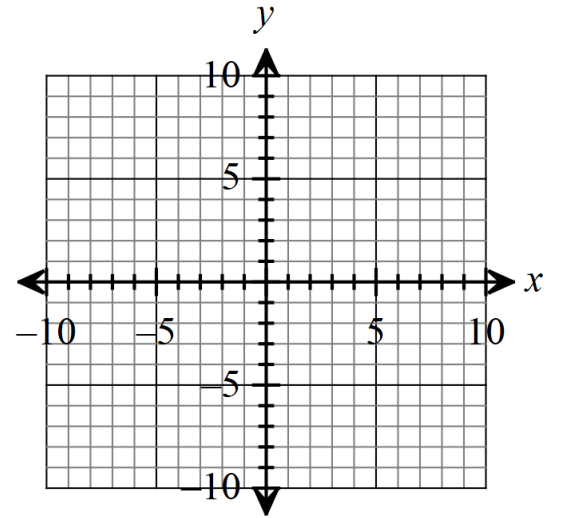


Graphs for #22-27

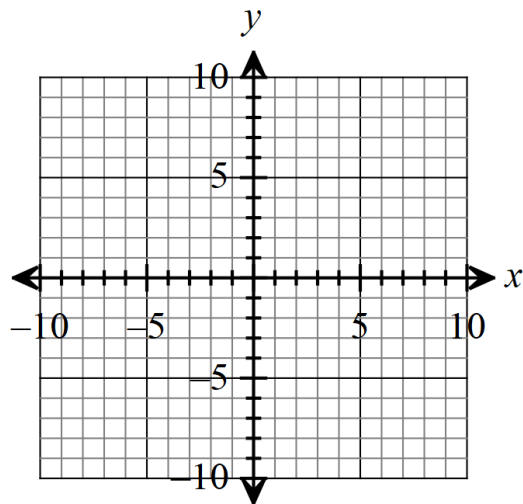
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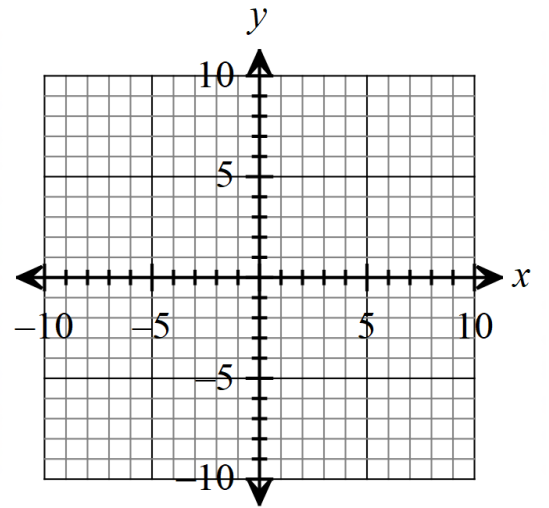
23.



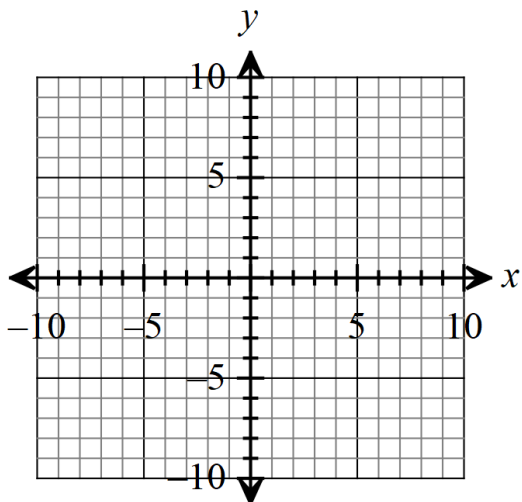
24.



25.



26.



27.

