WebAssign

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Diferencial, section B, Spring 2019
Instructor: Christiaan Ketelaar

1.3 Traslaciones y Reflexiones de Funciones (Homework)

Current Score : 25 / 25   **Due :** Wednesday, February 6, 2019 11:58 PM CST**Last Saved : n/a Saving... ()**

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

Request Extension

WebAssign
1.3 Traslaciones y Reflexiones de Funciones (Homework)

Current Score : 25 / 25   **Due :** Wednesday, February 6, 2019 11:58 PM CST**Last Saved : n/a Saving... ()**

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1. 2/2 points | Previous AnswersSCalc8 1.3.001.

Suppose the graph of f is given. Write equations for the graphs that are obtained from the graph of f as follows.

(a) Shift 6 units upward.

- $y = 6f(x)$
- $y = f(x) - 6$
- $y = f(x - 6)$
- $y = \frac{1}{6}-f(x)$
- ⦿ 🔑 $y = f(x) + 6$ ✔

(b) Shift 6 units downward.

- $y = f(x - 6)$
- $y = 6f(x)$
- $y = f(x) + 6$
- ⦿ 🔑 $y = f(x) - 6$
- $y = \frac{1}{6}-f(x)$ ✔

(c) Shift 6 units to the right.

- $y = f(x) + 6$
- $y = \frac{1}{6}-f(x)$
- $y = 6f(x)$
- ⦿ 🔑 $y = f(x - 6)$
- $y = f(x) - 6$ ✔

(d) Shift 6 units to the left.

- $y = f(x - 6)$
- $y = f(x) + 6$
- ⦿ 🔑 $y = f(x + 6)$
- $y = \frac{1}{6}-f(x)$
- $y = f(x) - 6$ ✔

(e) Reflect about the x-axis.

○ $y = f(x) + 6$

○ $y = 6f(x)$

○ $y = f(x - 6)$

○ $y \frac{1}{6}{-}f(x)$

◉ 🔑 $y = -f(x)$ ✔

(f) Reflect about the y-axis.

○ $y = f(x - 6)$

○ $y = 6f(x)$

○ $y \frac{1}{6}{-}f(x)$

○ $y = f(x) + 6$

◉ 🔑 $y = f(-x)$ ✔

(g) Stretch vertically by a factor of 6.

○ $y \frac{1}{6}{-}f(x)$

○ $y = f(x) + 6$

○ $y = f(x - 6)$

◉ 🔑 $y = 6f(x)$

○ $y = f(x) - 6$ ✔

(h) Shrink vertically by a factor of 6.

◉ 🔑 $y \frac{1}{6}{-}f(x)$

○ $y = f(x) + 6$

○ $y = f(x) - 6$

○ $y = 6f(x)$

○ $y = f(x - 6)$ ✔

Solution or Explanation

(a) If the graph of f is shifted 6 units upward, its equation becomes $y = f(x) + 6$.

(b) If the graph of f is shifted 6 units downward, its equation becomes $y = f(x) - 6$.

(c) If the graph of f is shifted 6 units to the right, its equation becomes $y = f(x - 6)$.

(d) If the graph of f is shifted 6 units to the left, its equation becomes $y = f(x + 6)$.

(e) If the graph of f is reflected about the x-axis, its equation becomes $y = -f(x)$.

(f) If the graph of f is reflected about the y-axis, its equation becomes $y = f(-x)$.

(g) If the graph of f is stretched vertically by a factor of 6, its equation becomes $y = 6f(x)$.

(h) If the graph of f is shrunk vertically by a factor of 6, its equation becomes $y = \dfrac{1}{6}f(x)$.

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2. 2/2 points | Previous AnswersSCalc8 1.3.002.

Explain how each graph is obtained from the graph of $y = f(x)$.

   (a) $y = f(x) + 2$

- ○ Shift the graph 2 units to the left.
- ○ Shift the graph 2 units downward.
- ○ Shift the graph 2 units to the right.
- ⦿ 🔑 Shift the graph 2 units upward.
- ○ Stretch the graph horizontally and vertically by a factor of 2.

✔

   (b) $y = f(x + 2)$

- ⦿ 🔑 Shift the graph 2 units to the left.
- ○ Shift the graph 2 units downward.
- ○ Shift the graph 2 units to the right.
- ○ Shift the graph 2 units upward.
- ○ Stretch the graph horizontally and vertically by a factor of 2.

✔

   (c) $y = 2f(x)$

- ○ Shift the graph 2 units to the left.
- ○ Stretch the graph horizontally and vertically by a factor of 2.
- ○ Shift the graph 2 units upward.
- ○ Shrink the graph horizontally by a factor of 2.
- ⦿ 🔑 Stretch the graph vertically by a factor of 2.

✔

   (d) $y = f(2x)$

- ○ Stretch the graph vertically by a factor of 2.
- ○ Shift the graph 2 units to the left.
- ○ Shift the graph 2 units upward.
- ○ Stretch the graph horizontally and vertically by a factor of 2.
- ⦿ 🔑 Shrink the graph horizontally by a factor of 2.

✔

   (e) $y = -f(x) - 1$

- ○ First reflect the graph about the x-axis, and then shift it 1 unit upward.
- ○ First reflect the graph about the y-axis, and then shift it 1 unit upward.
- ○ First reflect the graph about the y-axis, and then shift it 1 unit downward.
- ○ First reflect the graph about the x-axis, and then shift it 1 unit left.
- ⦿ 🔑 First reflect the graph about the x-axis, and then shift it 1 unit downward.

✔

(f) $y = 2f\left(\frac{1}{2}x\right)$

○ Shrink the graph horizontally and vertically by a factor of 2.

◉ 🔑 Stretch the graph horizontally and vertically by a factor of 2.

○ Stretch the graph horizontally by a factor of 2.

○ Shrink the graph horizontally by a factor of 2.

○ Stretch the graph vertically by a factor of 2.

✔

Solution or Explanation

(a) To obtain the graph of $y = f(x) + 2$ from the graph of $y = f(x)$, shift the graph 2 units upward.

(b) To obtain the graph of $y = f(x + 2)$ from the graph of $y = f(x)$, shift the graph 2 units to the left.

(c) To obtain the graph of $y = 2f(x)$ from the graph of $y = f(x)$, stretch the graph vertically by a factor of 2.

(d) To obtain the graph of $y = f(2x)$ from the graph of $y = f(x)$, shrink the graph horizontally by a factor of 2.

(e) To obtain the graph of $y = -f(x) - 1$ from the graph of $y = f(x)$, first reflect the graph about the x-axis, and then shift it 1 unit downward.

(f) To obtain the graph of $y = 2f\left(\frac{1}{2}x\right)$ from the graph of $y = f(x)$, stretch the graph horizontally and vertically by a factor of 2.

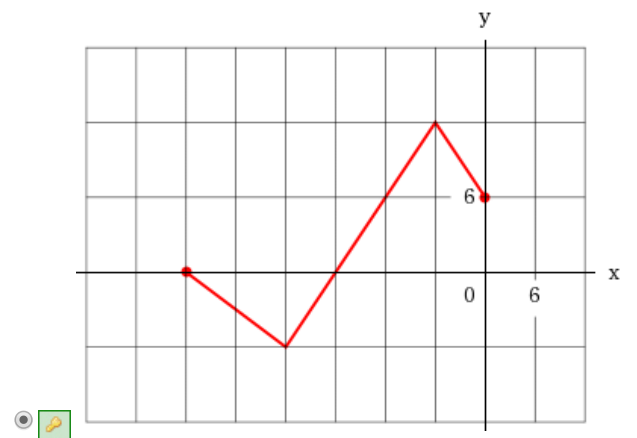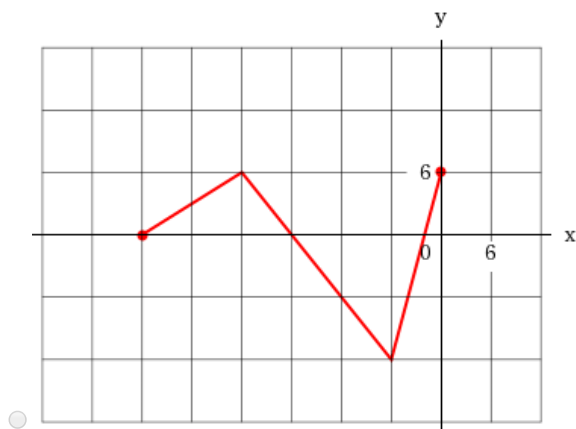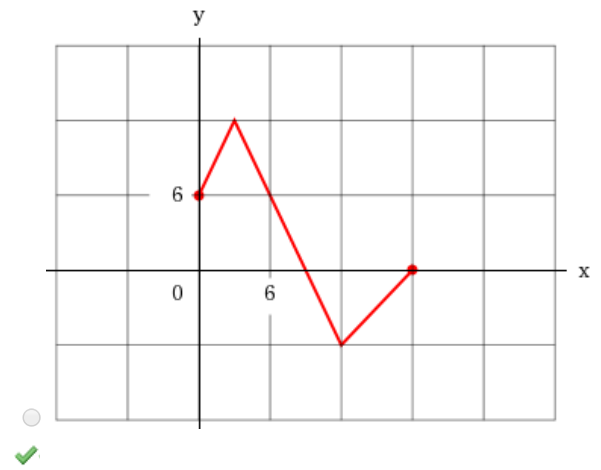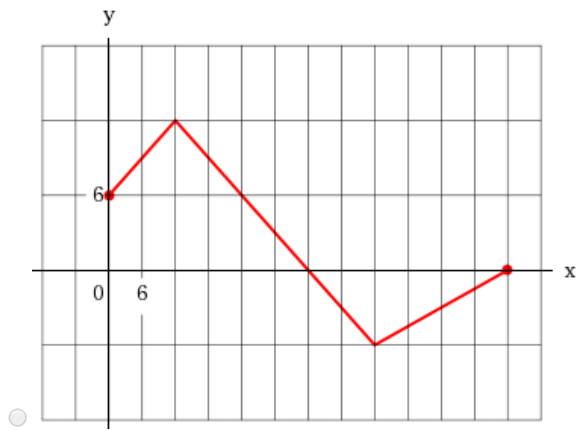**3.** 2/2 points | Previous AnswersSCalc8 1.3.003.

The graph of $y = f(x)$ is given. Match each equation with its graph.
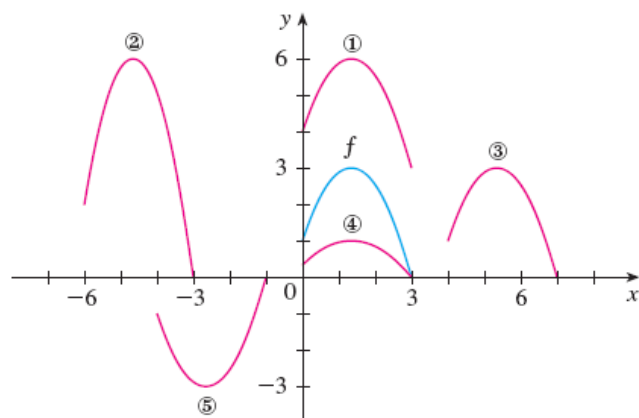
(a) $y = f(x - 4)$

- ○ 1
- ◉ 🔑 3
- ○ 4
- ○ 5

✔

(b) $y = f(x) + 3$

- ◉ 🔑 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

✔

(c) $y = \frac{1}{3}f(x)$

- ○ 1
- ○ 2
- ○ 3
- ◉ 🔑 4
- ○ 5

✔

(d) $y = -f(x + 4)$

○ 1

○ 2

○ 3

○ 4

◉ 🔑 5

✔

(e) $y = 2f(x + 6)$

○ 1

◉ 🔑 2

○ 3

○ 4

○ 5

✔

Solution or Explanation
[Click to View Solution](#)

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4. 2/2 points | Previous AnswersSCalc8 1.3.005.

The graph of *f* is given. Use it to graph the following functions.
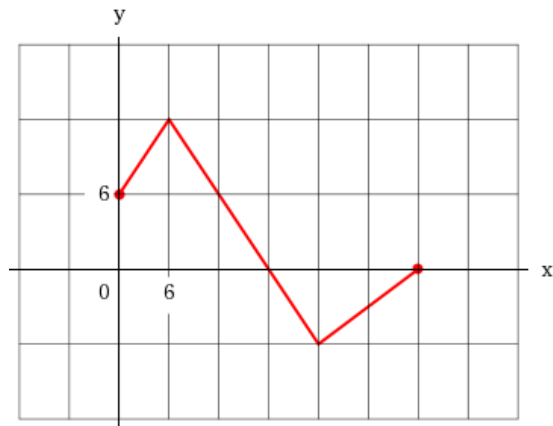
(a) $y = f(2x)$
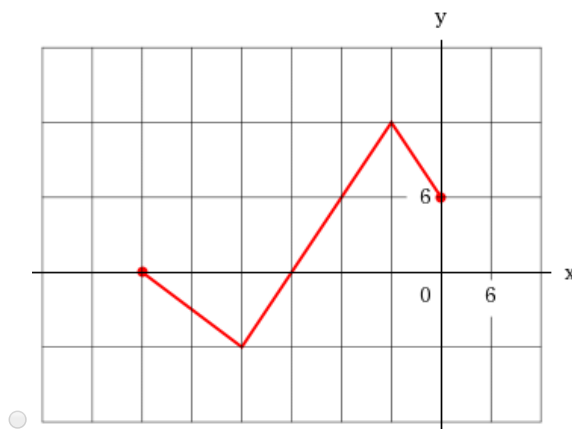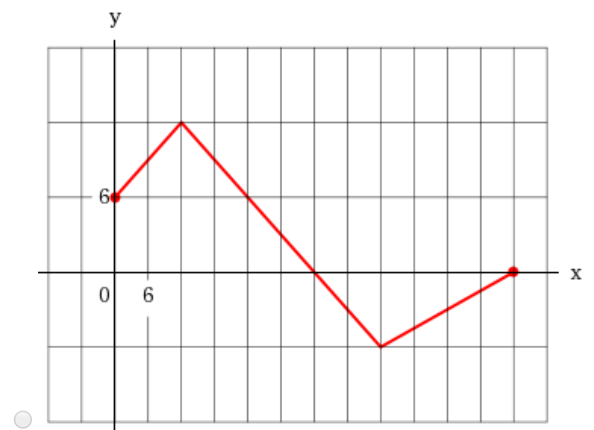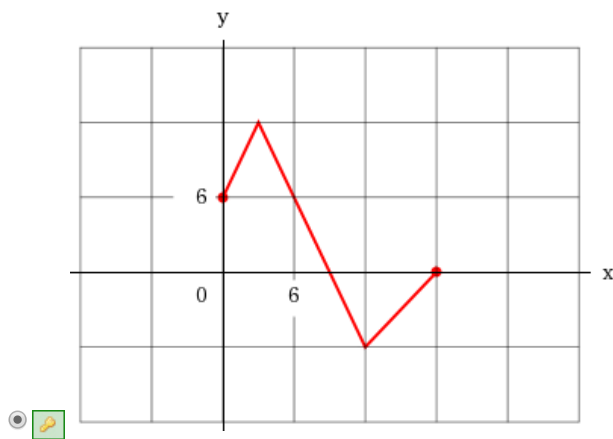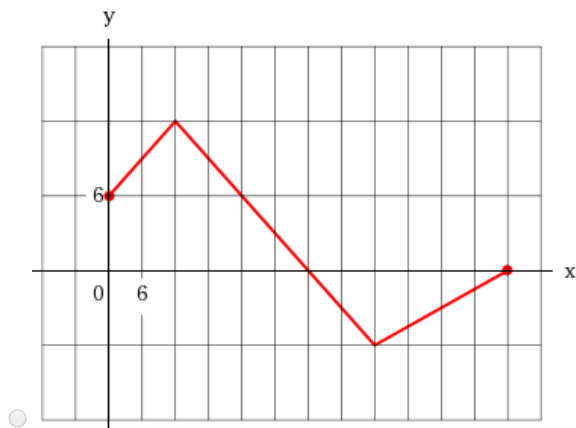

(b) $y = f\left(\frac{1}{2}x\right)$
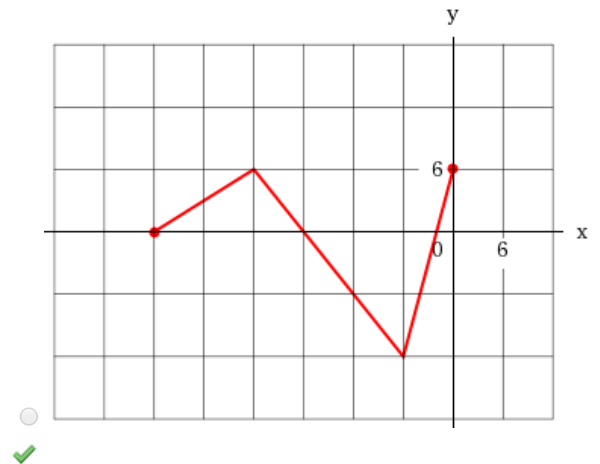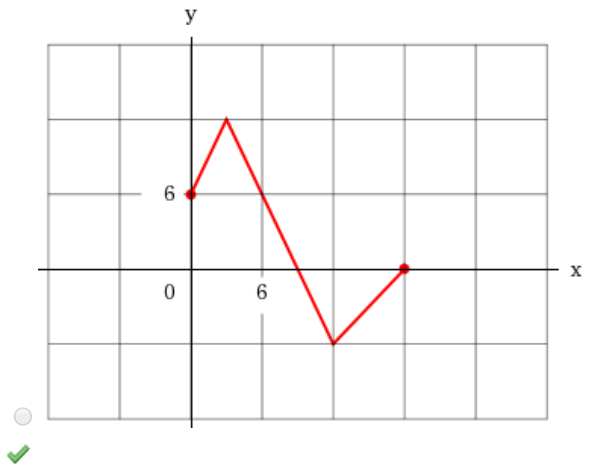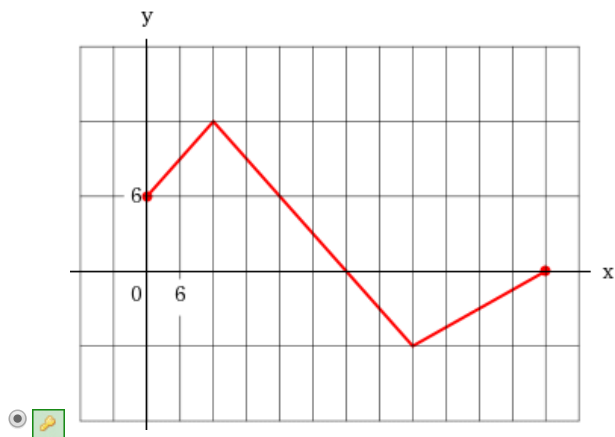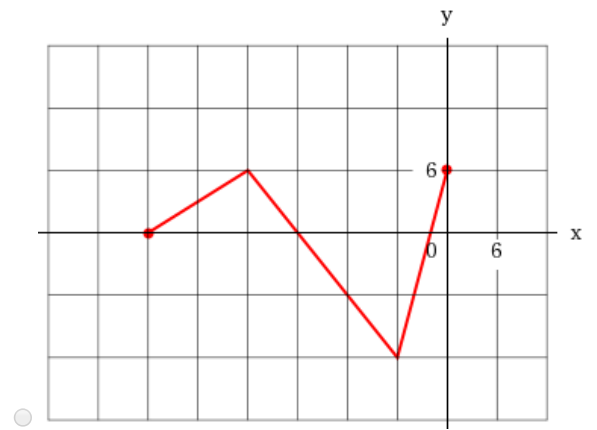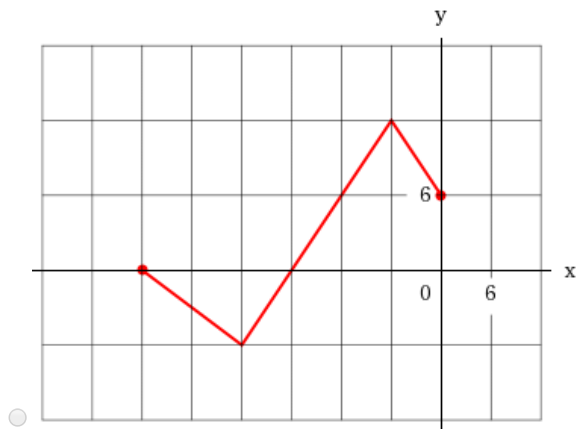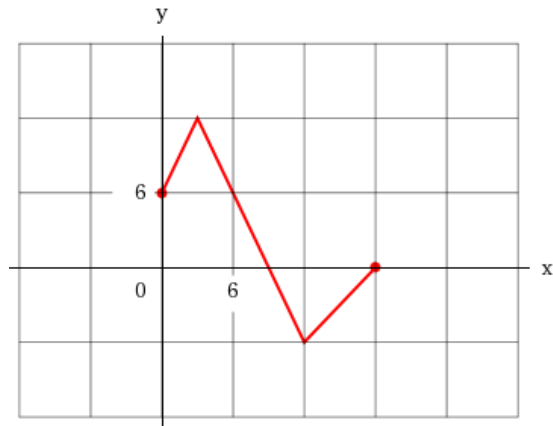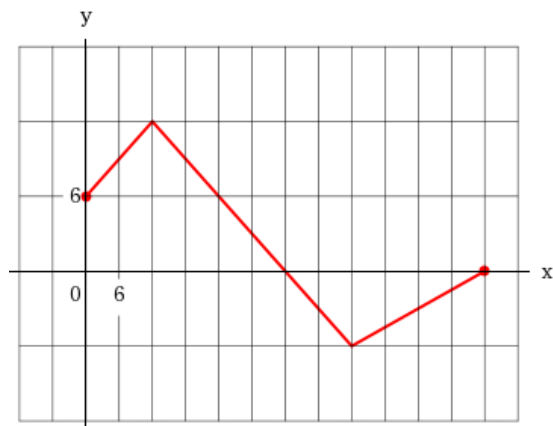
(c) $y = f(-x)$

(d) $y = -f(-x)$
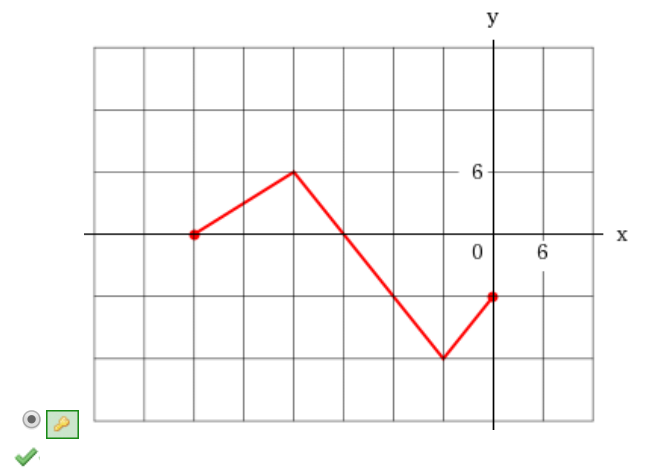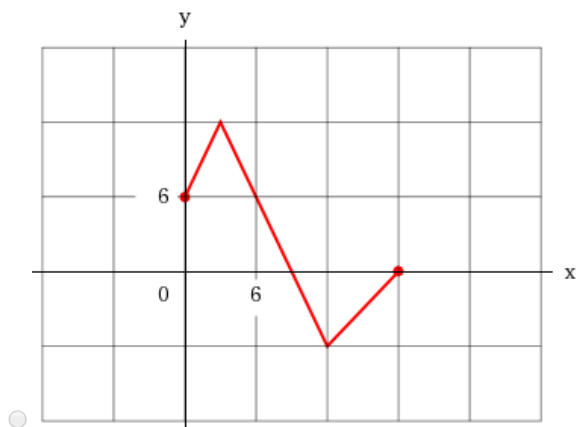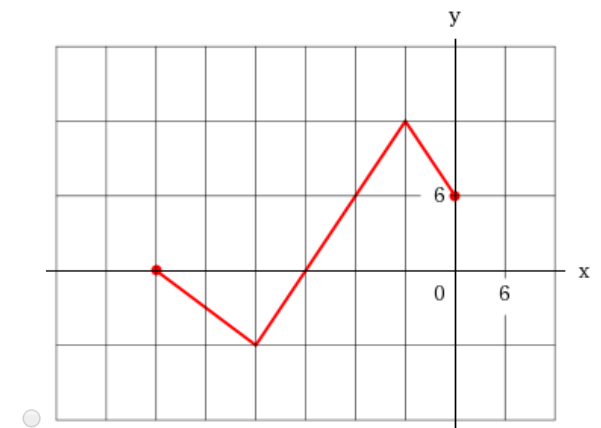
Solution or Explanation

(a) To graph $y = f(2x)$ we shrink the graph of f horizontally by a factor of 2.
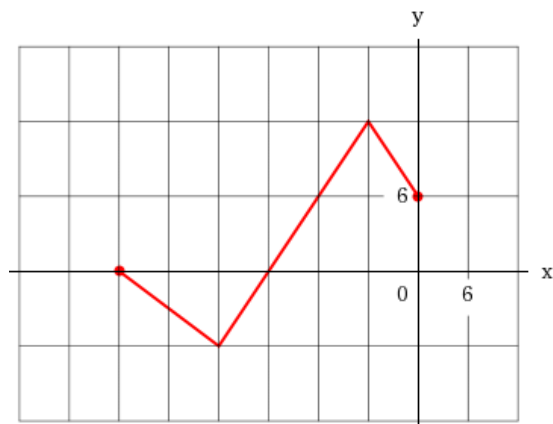

The point $(24, -6)$ on the graph of f corresponds to the point $\left(\frac{1}{2} \cdot 24, -6\right) = (12, -6)$.

(b) To graph $y = f\left(\frac{1}{2}x\right)$ we stretch the graph of f horizontally by a factor of 2.
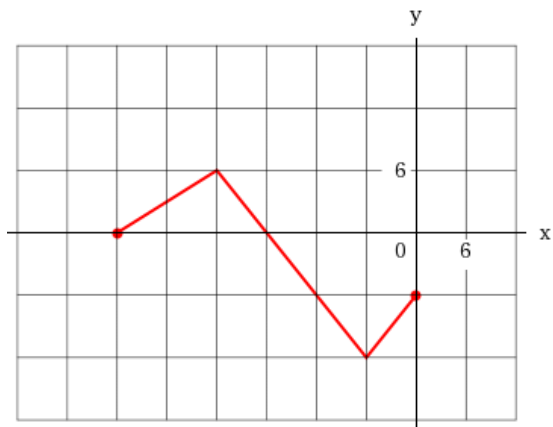

The point $(24, -6)$ on the graph of f corresponds to the point $(2 \cdot 24, -6) = (48, -6)$.

(c) To graph $y = f(-x)$ we reflect the graph of f about the y-axis.

The point $(24, -6)$ on the graph of f corresponds to the point $(-1 \cdot 24, -6) = (-24, -6)$.

(d) To graph $y = -f(-x)$ we reflect the graph of f about the y-axis, then about the x-axis.

The point $(24, -6)$ on the graph of *f* corresponds to the point $(-1 \cdot 24, -1 \cdot -6) = (-24, 6)$.

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5. 4/4 points | Previous AnswersSCalc8 1.3.006.MI.SA.

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

The graph of $y = \sqrt{7x - x^2}$ is given. Use transformations to create a function whose graph is as shown.
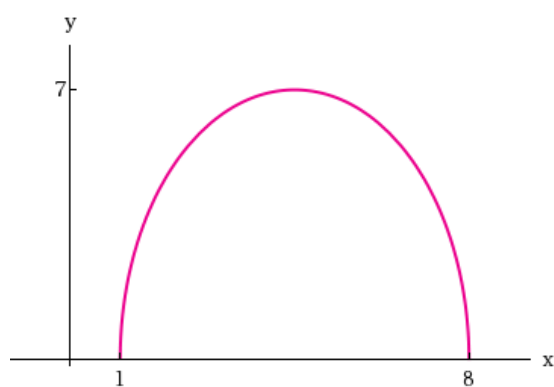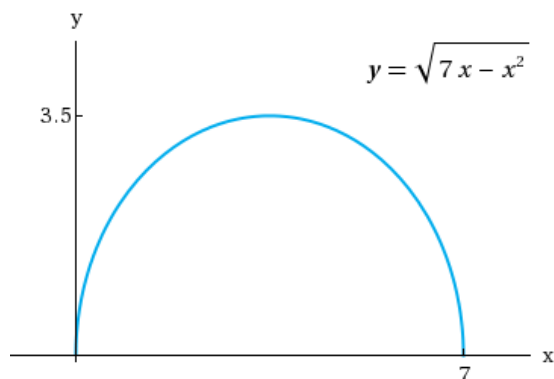
Step 1

By looking at the graph of y and comparing it to the red graph, we can tell that it has been shifted to the right by $\boxed{1}$ ✔   🔑 $\boxed{1}$ units and stretched vertically by a factor of $\boxed{2}$ ✔   🔑 $\boxed{2}$.

Step 2

Therefore, the new function has the form $y = \boxed{2}$ ✔   🔑 2 $f\left(x - \boxed{1}\right.$ ✔   🔑 $\left.1\right)$.

Step 3

Using the original function $y = \sqrt{7x - x^2}$, we can rewrite $y = 2f(x - 1)$ as follows.

$$y = 2\sqrt{7(x - 1) - \left(\boxed{x\text{-}1}\;✔ \;\;🔑\; x\text{-}1\right)^2}$$

$$= 2\sqrt{7x - 7 - (x^2 - 2x + 1)}$$

$$= \boxed{\$\$2\sqrt{-x2+9x-8}}$$

✔ $\boxed{2\sqrt{-8 + 9x - x^2}}$

You have now completed the Master It.

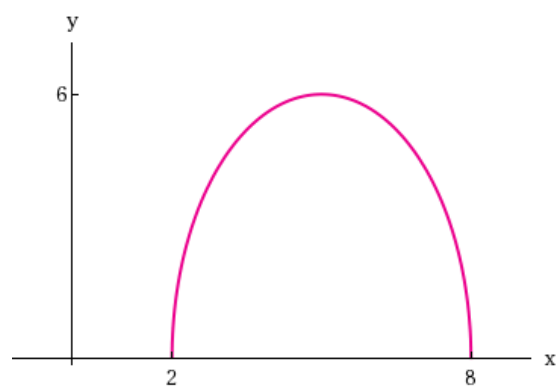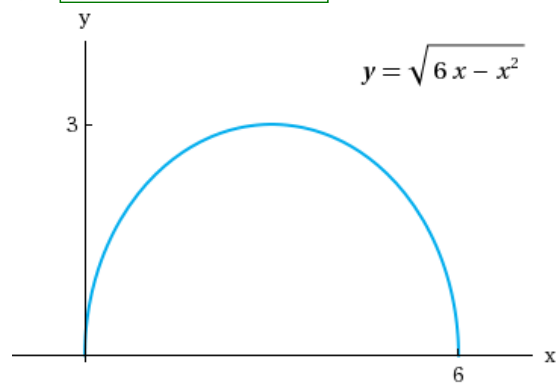**6.** 3/3 points | Previous AnswersSCalc8 1.3.006.MI.

The graph of $y = \sqrt{6x - x^2}$ is given. Use transformations to create a function whose graph is as shown.

$y =$

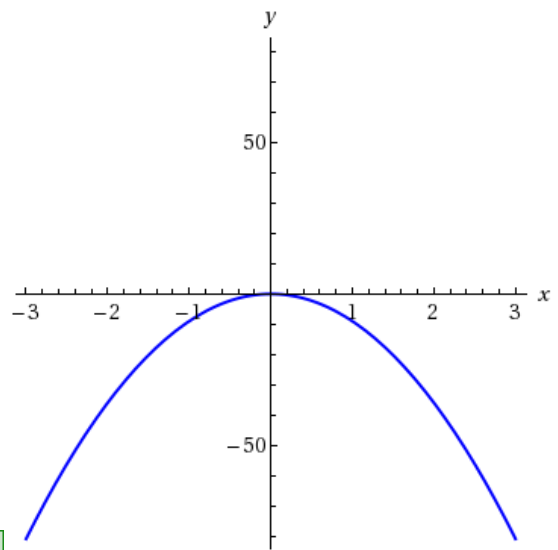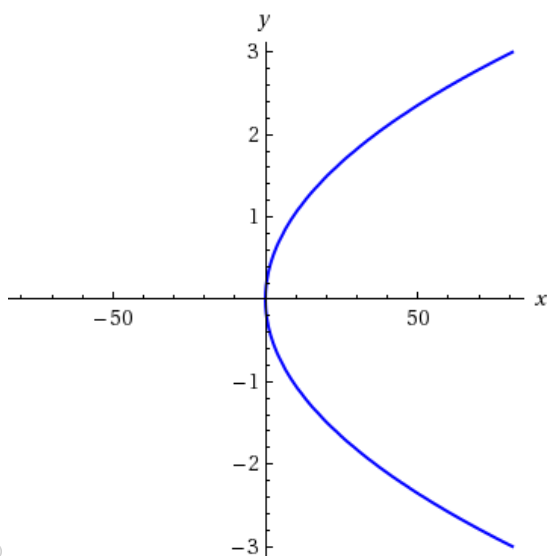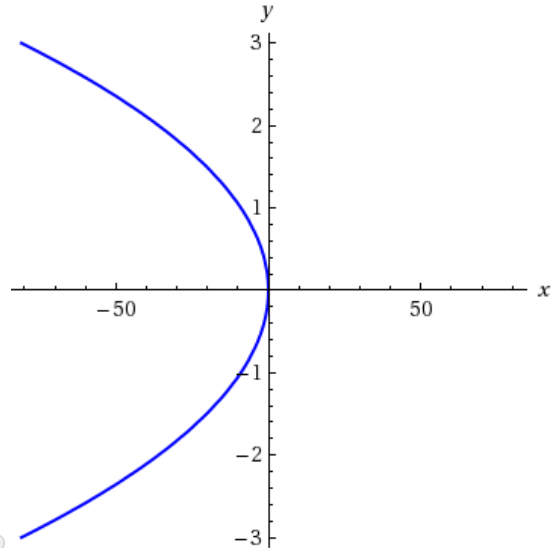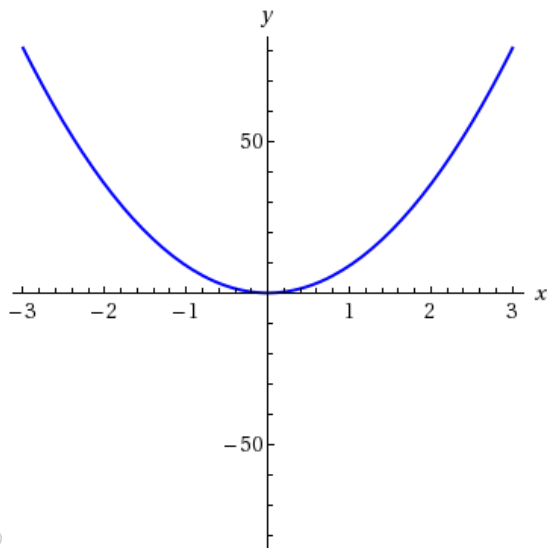$$2\sqrt{6(x-2)-(x-2)2}$$

✔ $2\sqrt{6(x-2)-(x-2)^2}$

$y = \sqrt{6x - x^2}$

Solution or Explanation
Click to View Solution

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7. 2/2 points | Previous AnswersSCalc8 1.3.009.

Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions given in Section 1.2, and then applying the appropriate transformations.
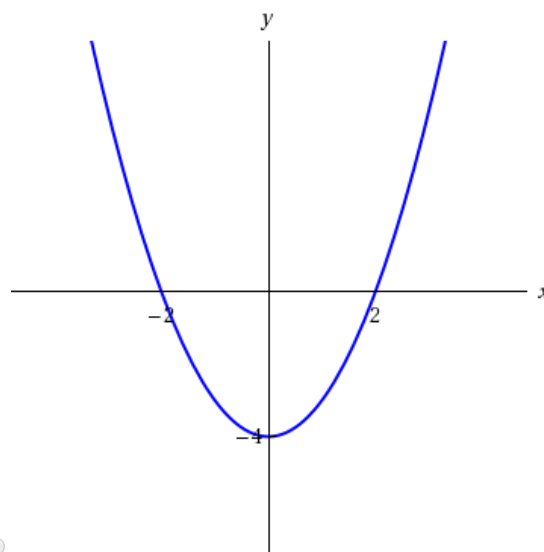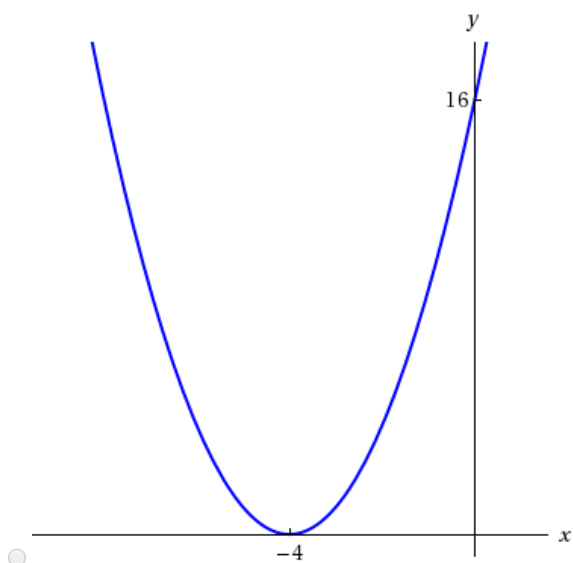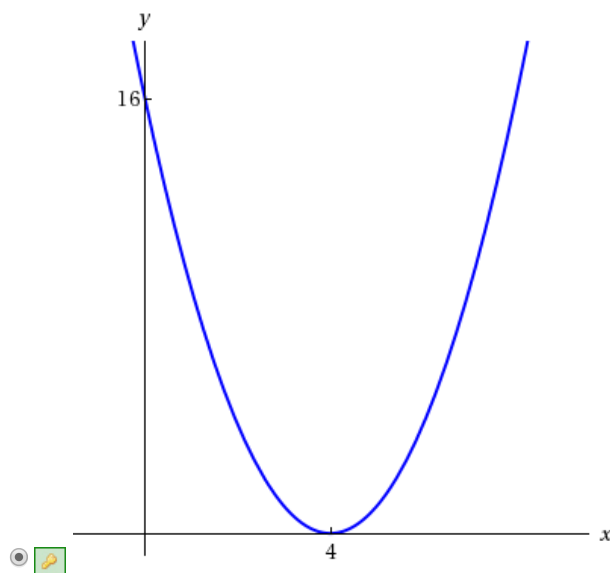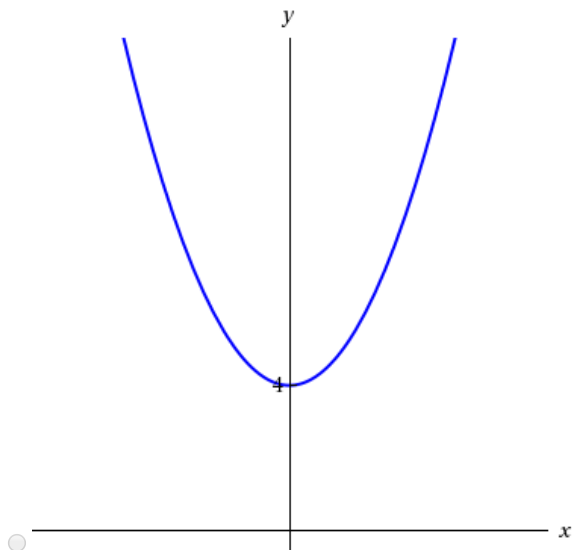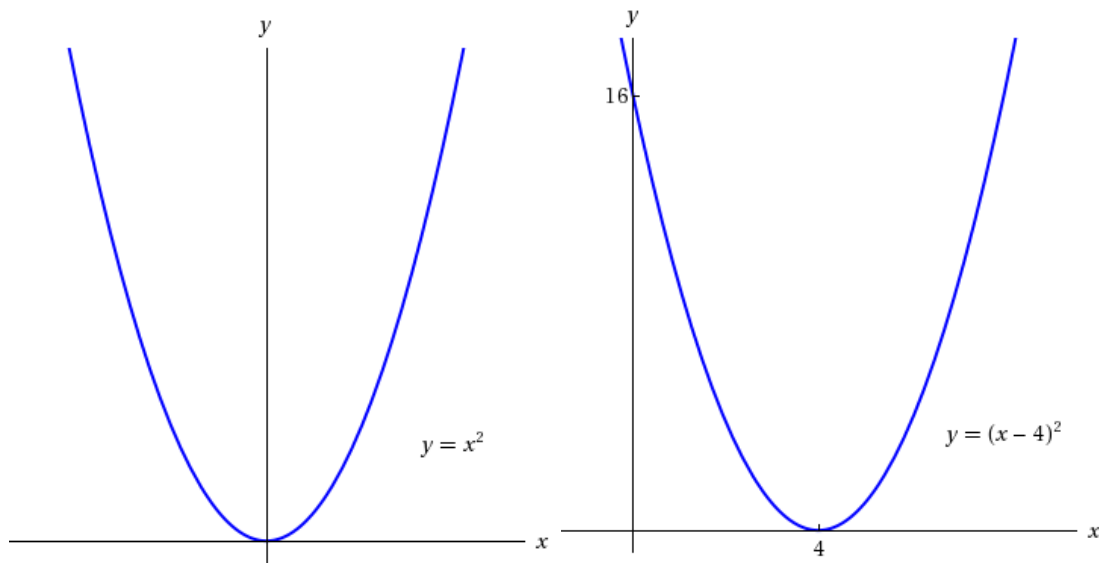
$y = -9x^2$

Solution or Explanation

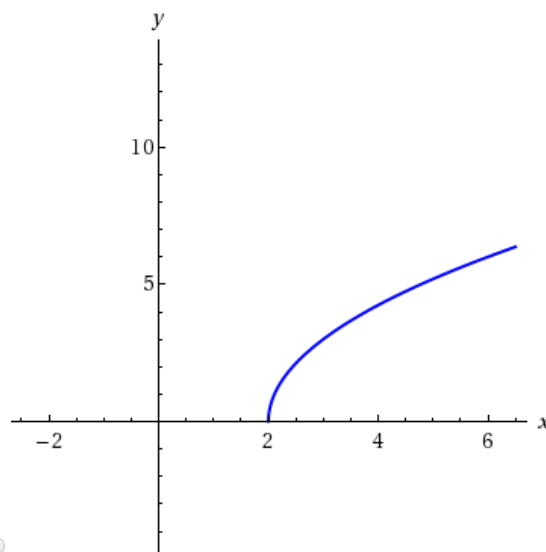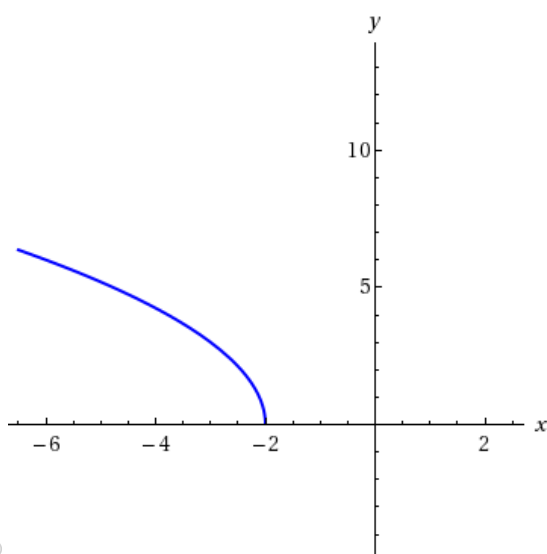$y = -9x^2$: Start with the graph of $y = 9x^2$ and reflect about the x-axis.

$y = 9\,x^2$

$y = -9\,x^2$

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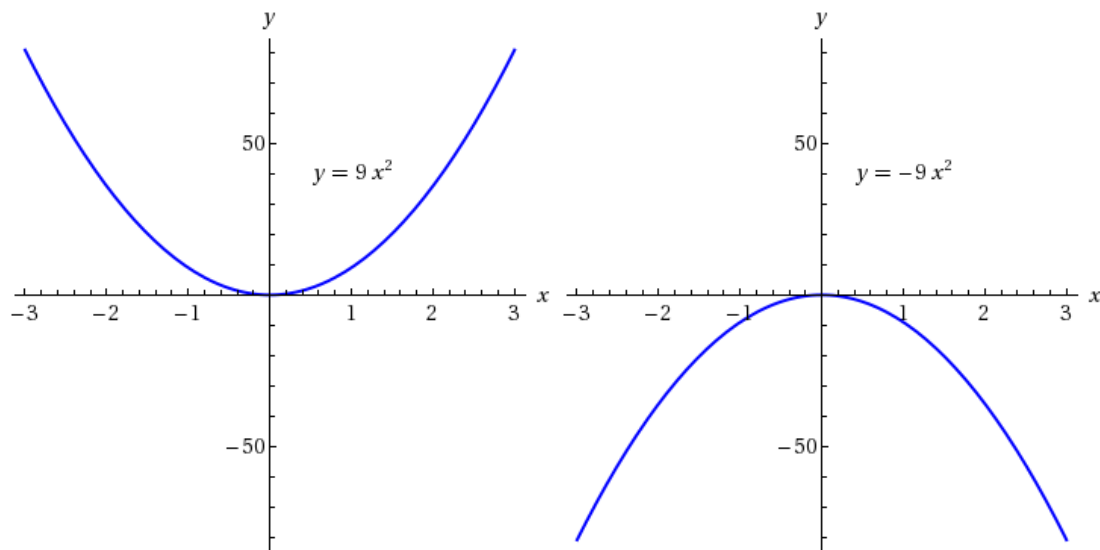
8. 2/2 points | Previous AnswersSCalc8 1.3.010.

Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions given in Section 1.2, and then applying the appropriate transformations.

$y = (x - 4)^2$
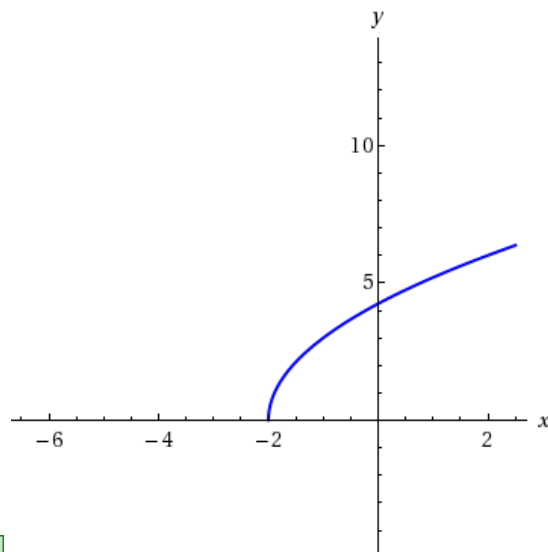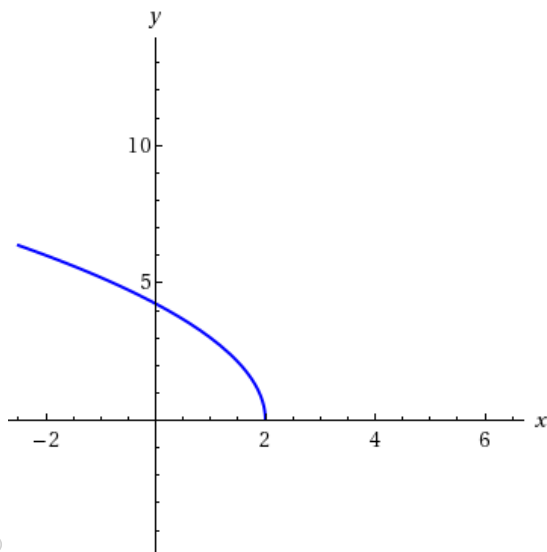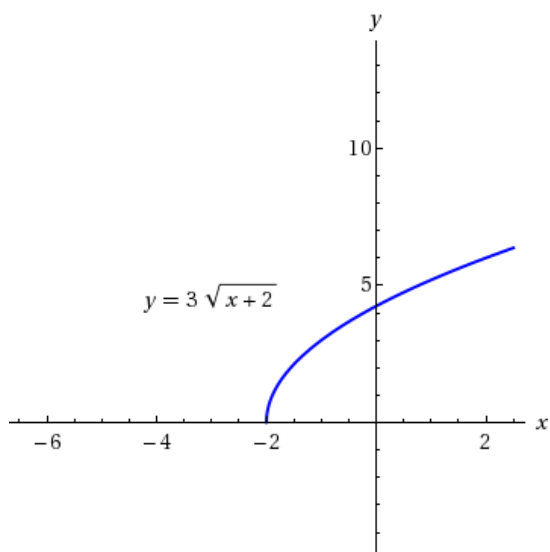
Solution or Explanation

$y = (x - 4)^2$: Start with the graph of $y = x^2$ and shift 4 units to the right.

$$y = x^2$$

$$y = (x - 4)^2$$

16

4

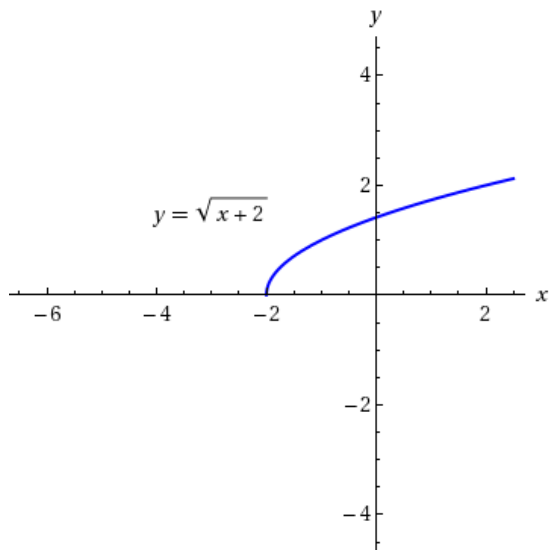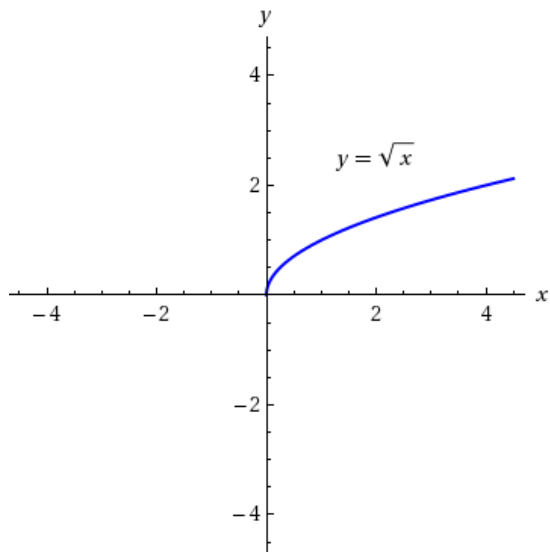**9.** 2/2 points | <u>Previous Answers</u>SCalc8 1.3.014.

Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions given in Section 1.2, and then applying the appropriate transformations.

$y = 3\sqrt{x + 2}$

Solution or Explanation

$y = 3\sqrt{x + 2}$: Start with the graph of $y = \sqrt{x}$, shift 2 units to the left, and then stretch vertically by a factor of 3.

$y = \sqrt{x}$

$y = \sqrt{x+2}$

$y = 3\sqrt{x+2}$

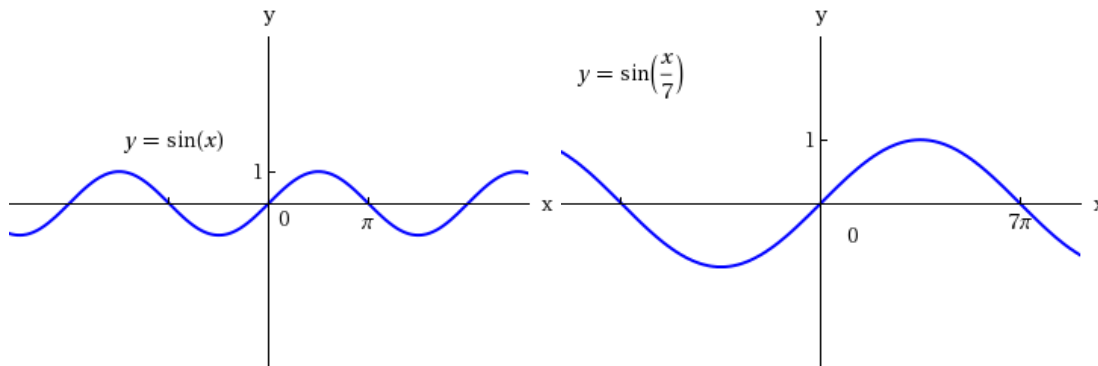**10.**2/2 points | Previous AnswersSCalc8 1.3.019.

Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions given in Section 1.2, and then applying the appropriate transformations.

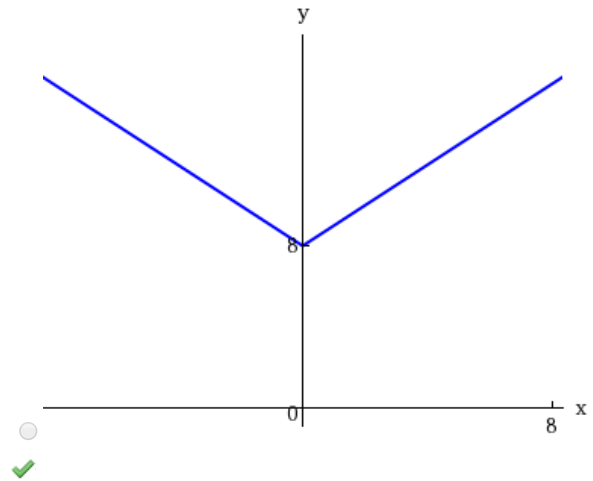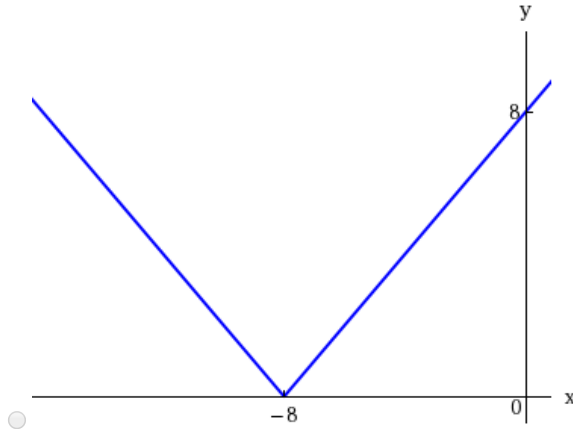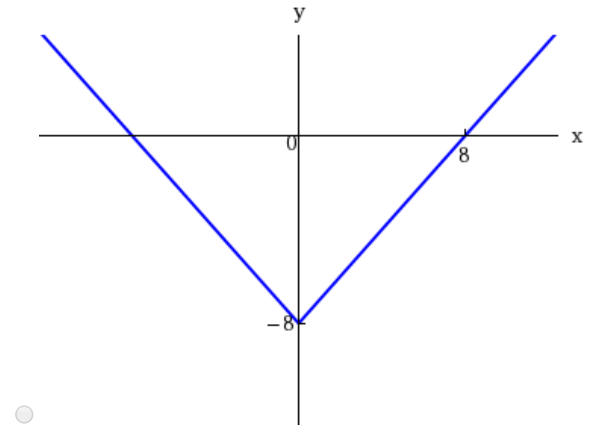$$y = \sin\left(\frac{1}{7}x\right)$$
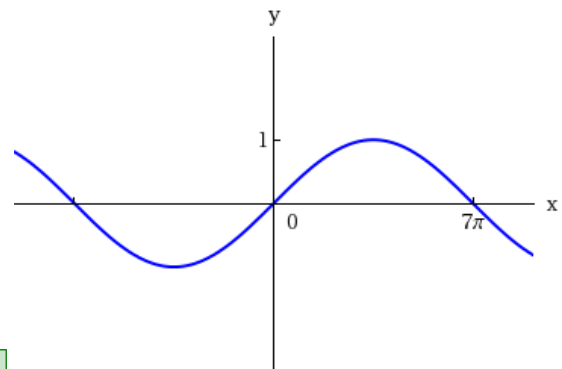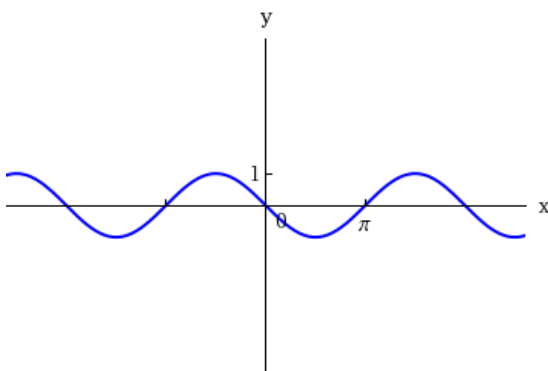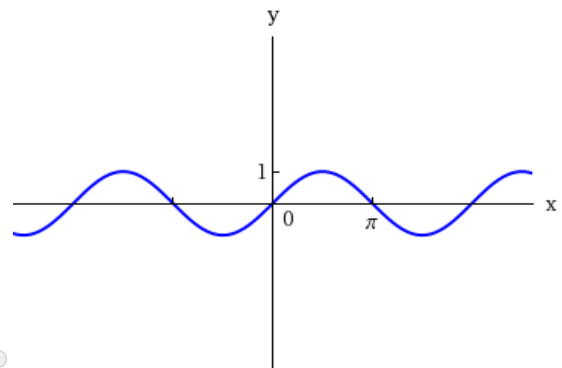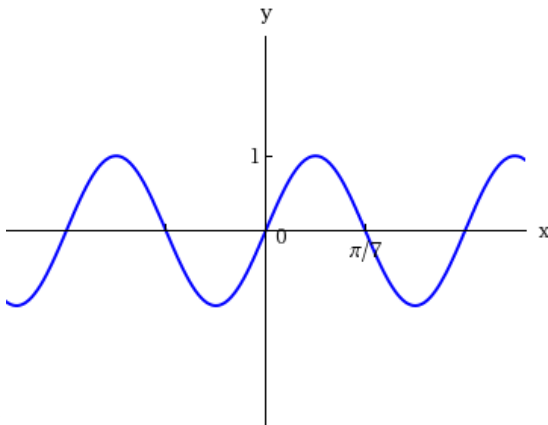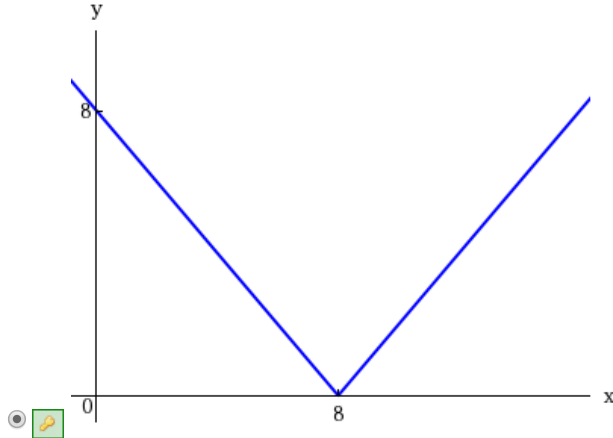

Solution or Explanation

$y = \sin(x/7)$: Start with the graph of $y = \sin x$ and stretch horizontally by a factor of 7.

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11. 2/2 points | Previous AnswersSCalc8 1.3.021.

Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions given in Section 1.2, and then applying the appropriate transformations.

$y = |x - 8|$

Solution or Explanation

$y = |x - 8|$: Start with the graph of $y = |x|$ and shift 8 units to the right.