

hw-18-techniques-of-graphing

Due: 12/13/2015 at 06:00am EST.

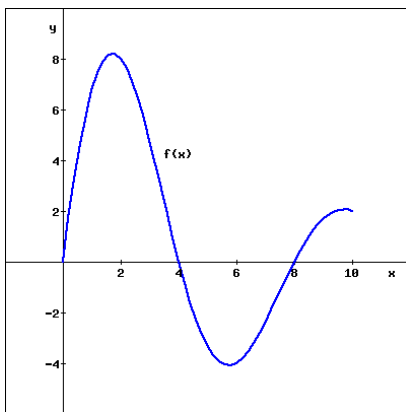
Students will be able to:

- Identify graphing transformations from a graph
- Apply graphing transformations to a graph
- Identify graphing transformations from a function
- Apply graphing transformations to a function

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt) Consider the function $y = f(x)$ drawn below:

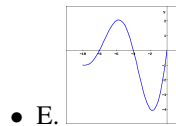


(click on image to enlarge)

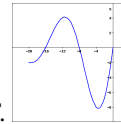
On a separate piece of paper, sketch an accurate graph of the function $y = -2f(x)$. Which (if any) of the graphs below matches the graph you drew?

- A.
- B.
- C.
- D.

(click on image to enlarge)

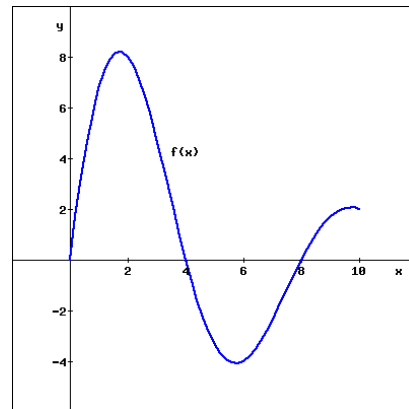


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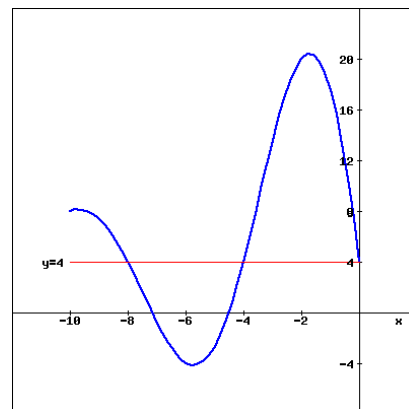
- G. None of the above

2. (1 pt) Consider the graph of $f(x)$ given below:



(click on image to enlarge)

Find a possible formula for the transformations of $f(x)$ shown below:



(click on image to enlarge)

$y =$ _____

3. (1 pt)

Let $f(x)$ be given by the (large) graph to the right. On a piece of paper, graph and label each function listed below. Then, match each formula with its graph from the list A-I below.

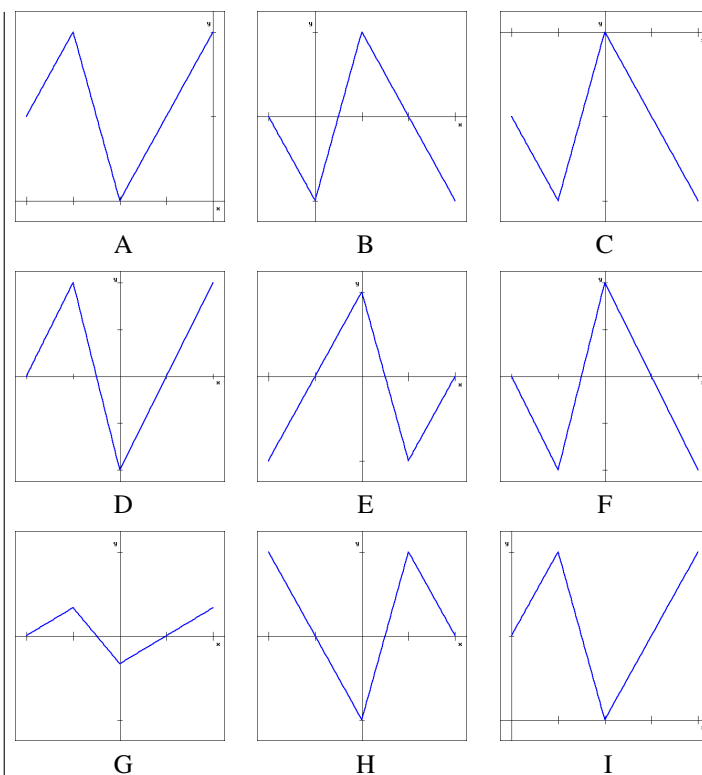
$y = \frac{1}{3}f(x)$

$y = -2f(x)$

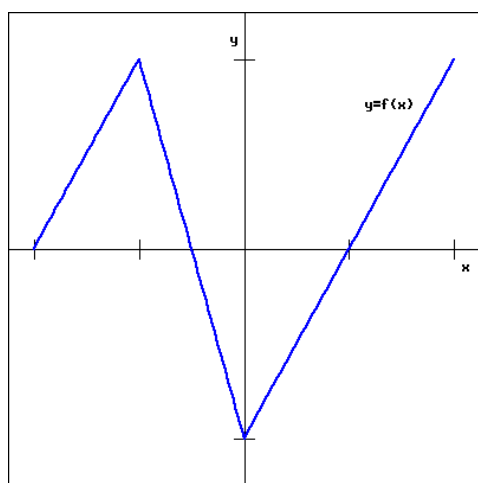
$y = -f(x-1)$

$f(-x)$

$y = 2f(x)$



(Click on a graph to enlarge it)



$y = f(x)$

4. (1 pt)

Match each formula with its graph.

$y = |x| - 1.2$

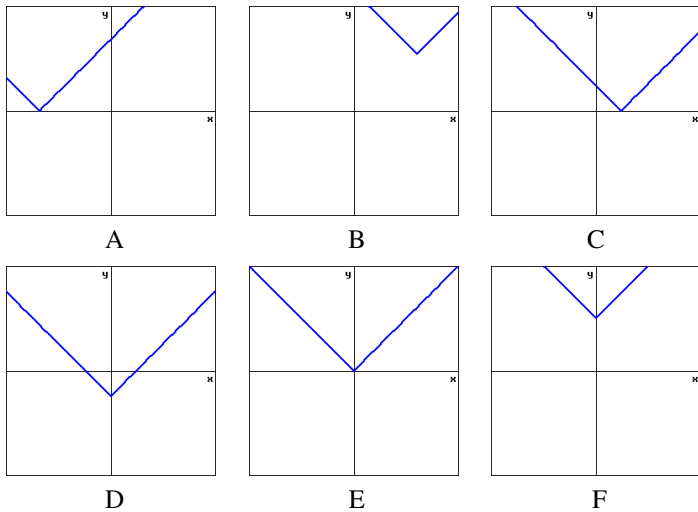
$y = |x|$

$y = |x - 3| + 2.7$

$y = |x| + 2.5$

$y = |x - 1.2|$

$y = |x + 3.4|$



(Click on a graph to enlarge it)

5. (1 pt)

Let $f(x)$ be given by the (large) graph. On a piece of paper, graph and label each function listed below. Then, match each formula with its graph from the list A-F below.

$y = -f(x-1)$

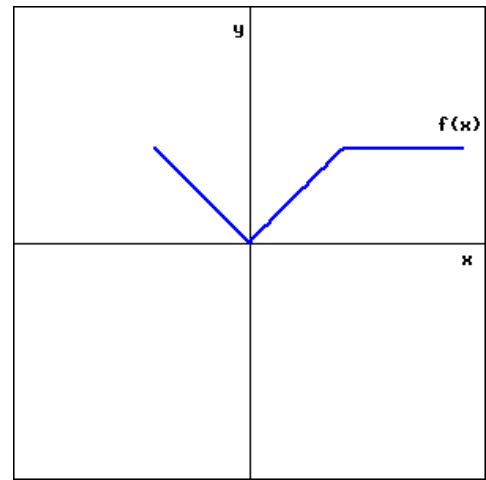
$y = -2 - f(x)$

$y = f(-x) + 3$

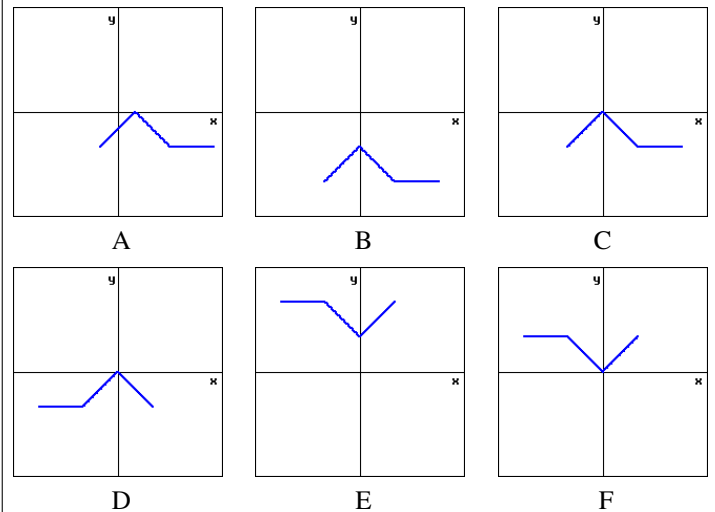
$y = -f(-x)$

$y = -f(x)$

$y = f(-x)$



$y = f(x)$



(Click on a graph to enlarge it)

6. (1 pt) **Part I.**

To obtain the graph of $y = (x-7)^3 + 9(x-7)^2 - 6$ from the graph of $y = x^3 + 9x^2$

one needs to do the following transformations:

- A. horizontal shift 6 units right
- B. horizontal shift 7 units right
- C. vertical shift 7 units up
- D. vertical shift 6 units down
- E. horizontal shift 6 units left
- F. vertical shift 7 units down
- G. vertical shift 6 units up
- H. horizontal shift 7 units left

Note: select all transformations that apply

Part II.

To obtain the graph of

$$y = (x + 7)^3 + 9(x + 7)^2 - 6$$

from the graph of

$$y = x^3 + 9x^2$$

one needs to do the following transformations:

- A. vertical shift 6 units up
- B. vertical shift 7 units down
- C. horizontal shift 7 units right
- D. vertical shift 7 units up
- E. horizontal shift 7 units left
- F. horizontal shift 6 units left
- G. horizontal shift 6 units right
- H. vertical shift 6 units down

Note: select all transformations that apply

7. (1 pt) Part I.

To obtain the graph of

$$y = f(x + 3) - 5$$

from the graph of

$$y = f(x)$$

one needs to do the following transformations:

- A. horizontal shift 5 units left
- B. horizontal shift 3 units right
- C. vertical shift 5 units down
- D. vertical shift 5 units up
- E. horizontal shift 5 units right
- F. vertical shift 3 units up
- G. vertical shift 3 units down
- H. horizontal shift 3 units left

Note: select all transformations that apply

Part II.

To obtain the graph of

$$y = f(x + 3) + 5$$

from the graph of

$$y = f(x)$$

one needs to do the following transformations:

- A. vertical shift 3 units up
- B. vertical shift 5 units down
- C. vertical shift 3 units down
- D. horizontal shift 5 units left
- E. horizontal shift 3 units left
- F. horizontal shift 3 units right
- G. vertical shift 5 units up
- H. horizontal shift 5 units right

Note: select all transformations that apply

Part III.

To obtain the graph of

$$y = f(x - 3) + 5$$

from the graph of

$$y = f(x)$$

one needs to do the following transformations:

- A. horizontal shift 3 units right
- B. horizontal shift 5 units left
- C. vertical shift 5 units up
- D. vertical shift 5 units down
- E. horizontal shift 3 units left
- F. horizontal shift 5 units right
- G. vertical shift 3 units down
- H. vertical shift 3 units up

Note: select all transformations that apply

8. (1 pt) PART I.

Suppose we start with the graph of $y = x^2 - 3x$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

1. Horizontal shift 2 units left

2. Vertical shift 6 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = x^2 - 3x$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

1. Horizontal shift 2 units left

2. Vertical shift 6 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

9. (1 pt) PART I.

Suppose we start with the graph of $y = x^2 + 8x - 14$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

1. Horizontal shift 4 units right

2. Vertical shift 6 units down

3. Reflection with respect to x axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = x^2 + 8x - 14$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

1. Reflection with respect to x axis

2. Horizontal shift 4 units right

3. Vertical shift 6 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

10. (1 pt) PART I.

Suppose we start with the graph of $y = 2|x|$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Horizontal shift 4 units right
- Vertical shift 6 units up
- Reflection with respect to x axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = 2|x|$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Reflection with respect to x axis
- Horizontal shift 4 units right
- Vertical shift 6 units up

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

11. (1 pt) PART I.

Suppose we start with the graph of $y = x^2 - 8x$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Horizontal shift 5 units right
- Vertical shift 7 units down
- Reflection with respect to y axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = x^2 - 8x$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Reflection with respect to y axis
- Horizontal shift 5 units right
- Vertical shift 7 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

12. (1 pt) PART I.

Suppose we start with the graph of $y = |x + 7|$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Horizontal shift 2 units left
- Vertical shift 6 units down
- Reflection with respect to y axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = |x + 7|$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Reflection with respect to y axis
- Horizontal shift 2 units left
- Vertical shift 6 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

13. (1 pt) PART I.

Suppose we start with the graph of $y = \sqrt{x}$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Horizontal shift 5 units left
- Vertical shift 3 units down
- Reflection with respect to x axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

PART II.

Suppose we start with the graph of $y = \sqrt{x}$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Reflection with respect to x axis
- Horizontal shift 5 units left
- Vertical shift 3 units down

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

14. (1 pt) PART I.

Suppose we start with the graph of $y = \sqrt{x}$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Horizontal shift 6 units left
- Vertical shift 4 units up
- Reflection with respect to y axis

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

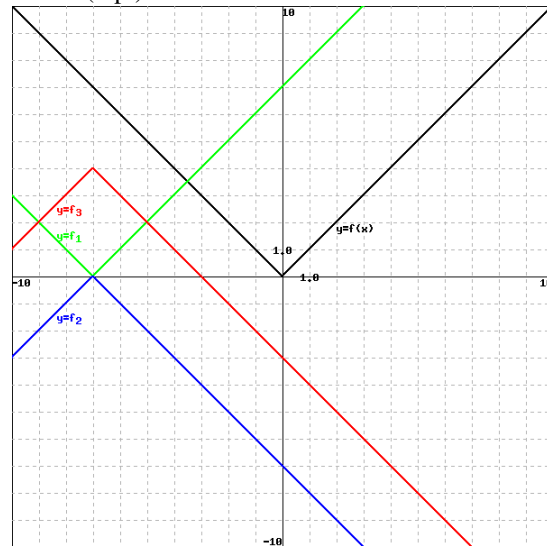
PART II.

Suppose we start with the graph of $y = \sqrt{x}$ and apply the following sequence of transformations to obtain a graph of a new function $g(x)$

- Reflection with respect to y axis
- Horizontal shift 6 units left
- Vertical shift 4 units up

A formula for the transformed function is $g(x) = \underline{\hspace{2cm}}$

15. (1 pt)



The graph of $f(x) = |x|$ is sketched in black and it had undergone a series of transformations to graphs of functions f_1 sketched in green, f_2 sketched in blue, and f_3 sketched in red.

That is, the sequence of transformation is as follows:

$$f \rightarrow f_1 \rightarrow f_2 \rightarrow f_3.$$

Find a formula for the function $f_1(x)$

$$f_1(x) = \underline{\hspace{2cm}}$$

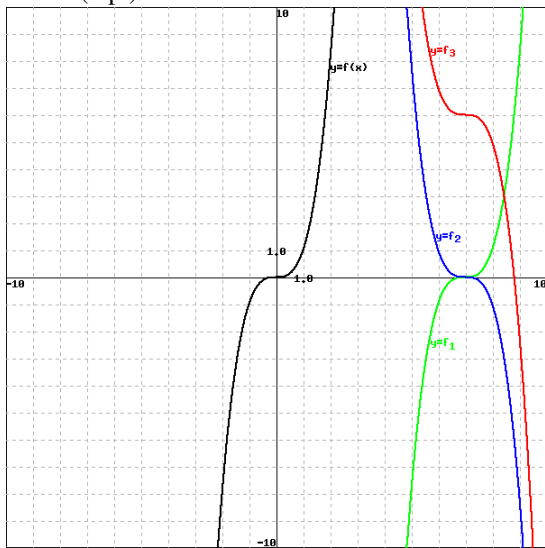
Find a formula for the function $f_2(x)$

$$f_2(x) = \underline{\hspace{2cm}}$$

Find a formula for the function $f_3(x)$

$$f_3(x) = \underline{\hspace{2cm}}$$

16. (1 pt)



The graph of $f(x) = x^3$ is sketched in black and it had undergone a series of transformations to graphs of functions f_1 sketched in green, f_2 sketched in blue, and f_3 sketched in red. That is, the sequence of transformation is as follows: $f \rightarrow f_1 \rightarrow f_2 \rightarrow f_3$.

Find a formula for the function $f_1(x)$

$$f_1(x) = \underline{\hspace{2cm}}$$

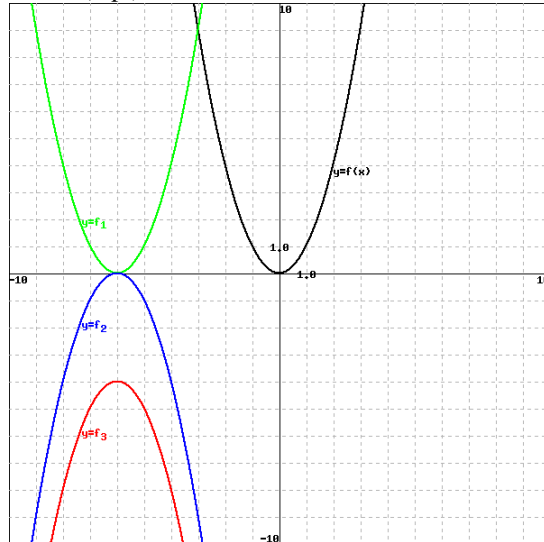
Find a formula for the function $f_2(x)$

$$f_2(x) = \underline{\hspace{2cm}}$$

Find a formula for the function $f_3(x)$

$$f_3(x) = \underline{\hspace{2cm}}$$

17. (1 pt)



The graph of $f(x) = x^2$ is sketched in black and it had undergone a series of transformations to graphs of functions f_1 sketched in green, f_2 sketched in blue, and f_3 sketched in red. That is, the sequence of transformation is as follows: $f \rightarrow f_1 \rightarrow f_2 \rightarrow f_3$.

Find a formula for the function $f_1(x)$

$$f_1(x) = \underline{\hspace{2cm}}$$

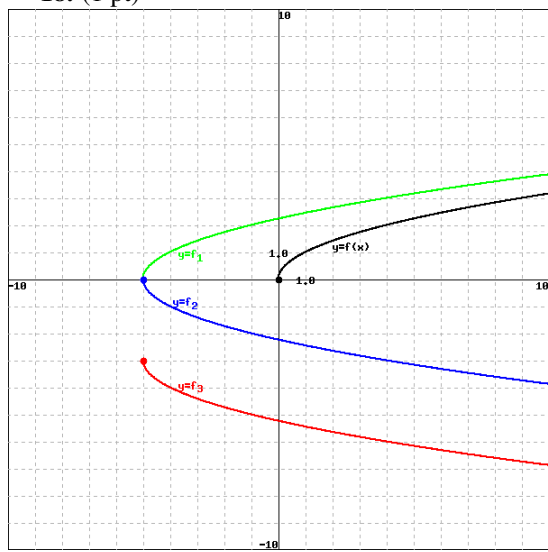
Find a formula for the function $f_2(x)$

$$f_2(x) = \underline{\hspace{2cm}}$$

Find a formula for the function $f_3(x)$

$$f_3(x) = \underline{\hspace{2cm}}$$

18. (1 pt)



The graph of $f(x) = \sqrt{x}$ is sketched in black and it had undergone a series of transformations to graphs of functions f_1 sketched in green, f_2 sketched in blue, and f_3 sketched in red.

That is, the sequence of transformation is as follows:
 $f \rightarrow f_1 \rightarrow f_2 \rightarrow f_3$.

Find a formula for the function $f_1(x)$

$$f_1(x) = \underline{\hspace{2cm}}$$

Find a formula for the function $f_2(x)$

$$f_2(x) = \underline{\hspace{2cm}}$$

Find a formula for the function $f_3(x)$

$$f_3(x) = \underline{\hspace{2cm}}$$