

Graphing Reminders

Transformations are done in the following order:

- 1) Dilations
- 2) Reflections
- 3) Translations

Reflections:

$-f(x)$ is a reflection across the x-axis.

$f(-x)$ is a reflection across the y-axis.

Dilations:

$\frac{y}{b} = f(x)$ is the same thing as $y = bf(x)$. Both represent a vertical dilation by a factor of b .

$y = f\left(\frac{x}{a}\right)$ is a horizontal dilation by a factor of a .

Note: $y = f\left(\frac{x}{1/4}\right)$ is the same as $y = f(4x)$. Both represent a horizontal dilation by a factor of $\frac{1}{4}$.

$\frac{y}{1/6} = f(x)$ is the same as $6y = f(x)$ which is the same as $y = \frac{1}{6}f(x)$. All represent a vertical dilation by a factor of $\frac{1}{6}$.

Graph each function

1. $f(x) = x^2 - 3$

2. $g(x) = -\sqrt{x+3}$

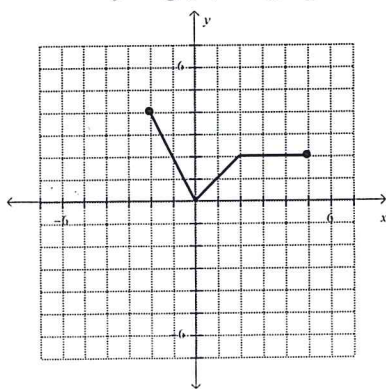
3. $f(x) = (x-4)^2 + 2$

4. $f(x) = \sqrt{-(x-2)} + 3$

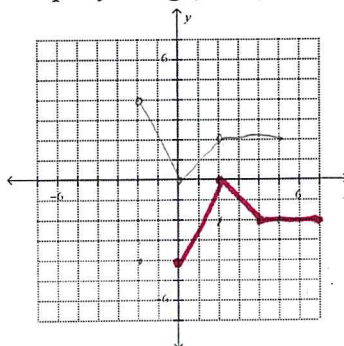
5. $f(x) = -x^2 + 5$

6. $f(x) = -(x-4)^2$

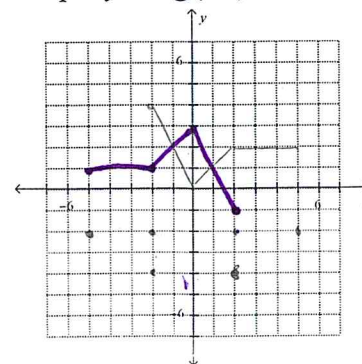
The function $y = g(x)$ is graphed on the left below.



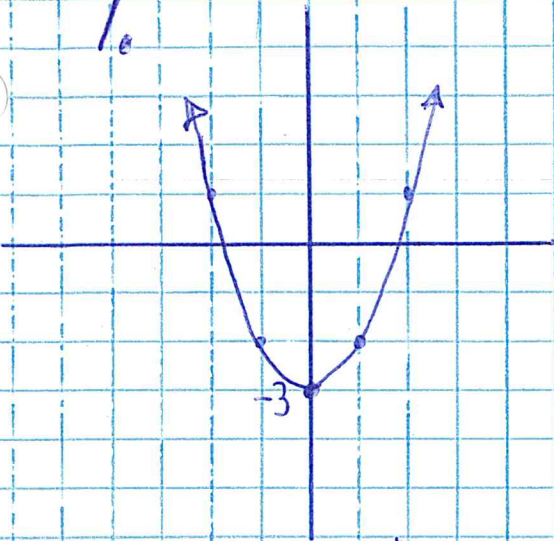
7. Graph $y = -g(x-2)$



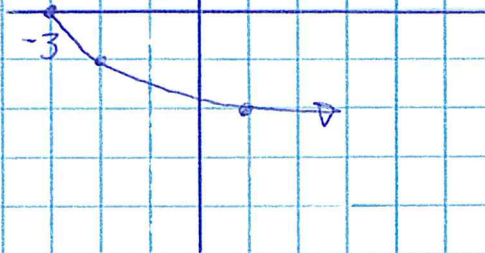
8. Graph $y = -g(-x) + 3$



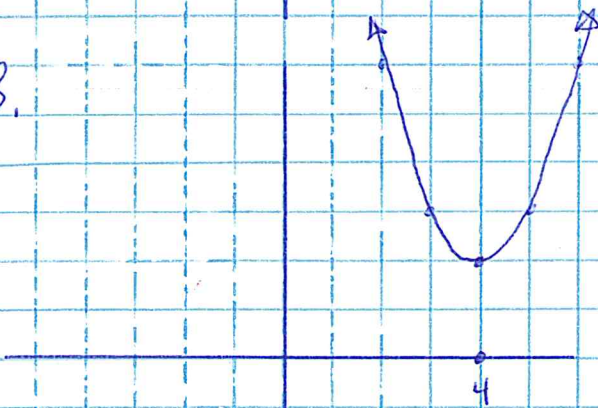
1.



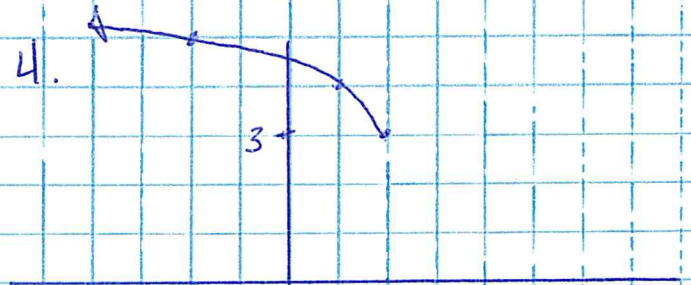
2.



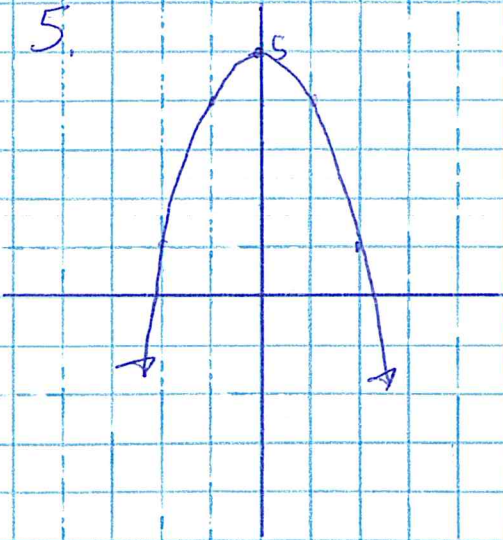
3.



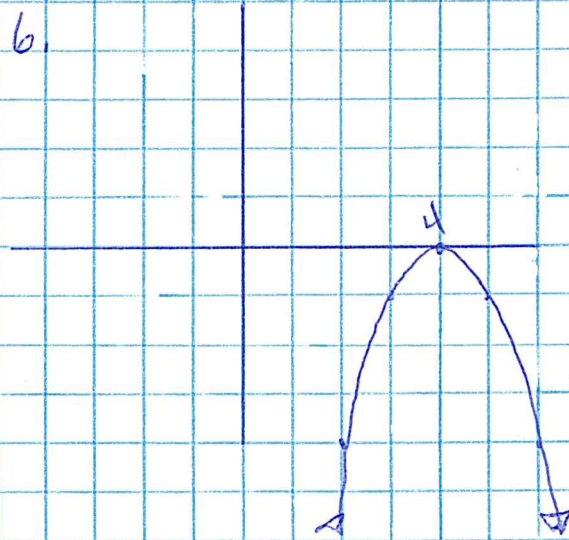
4.



5.

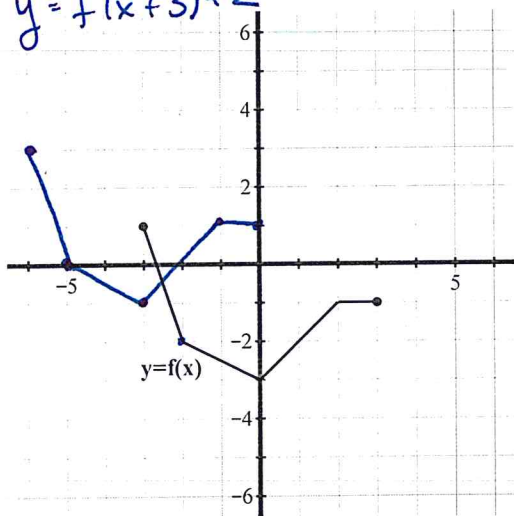


6.

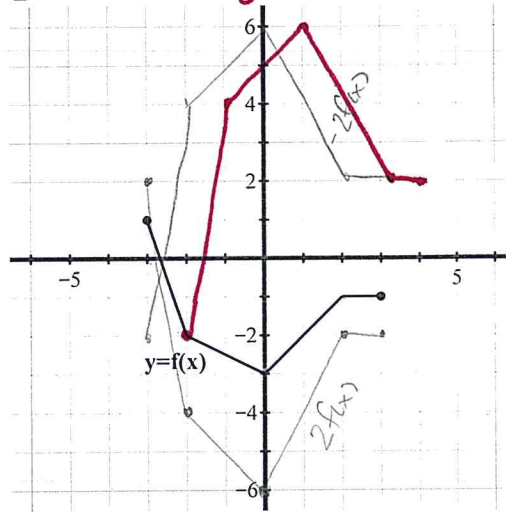


Given the graph of $y = f(x)$, graph each of the following.

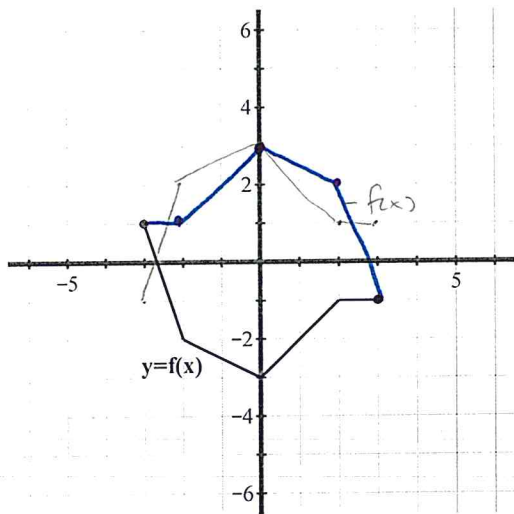
1. $y - 2 = f(x + 3)$
 $y = f(x + 3) + 2$



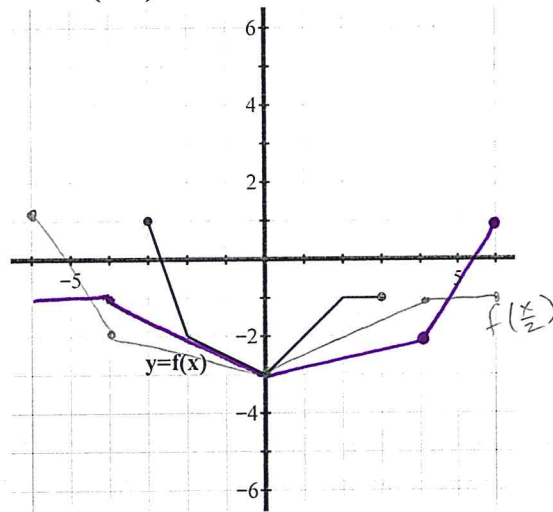
2. $\frac{y}{2} = -f(x - 1)$ $y = -2f(x - 1)$



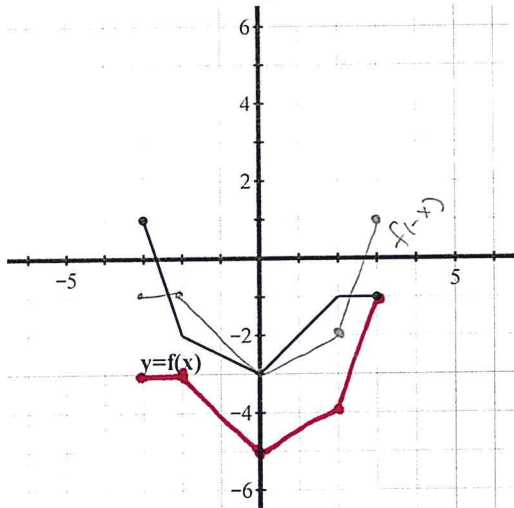
3. $y = -f(-x)$



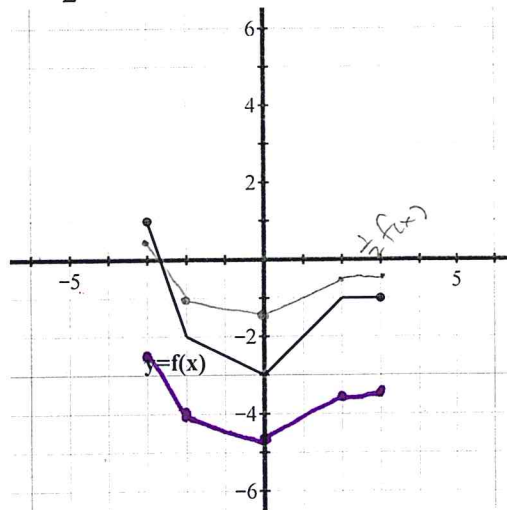
4. $y = f\left(\frac{-x}{2}\right)$



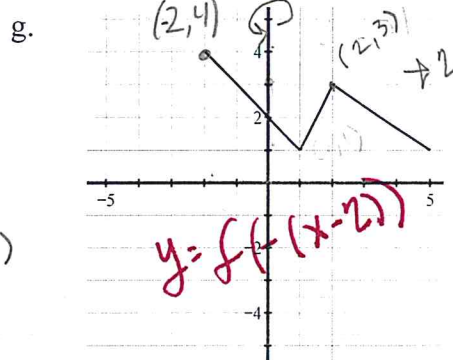
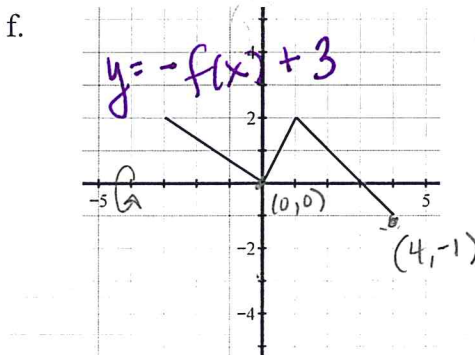
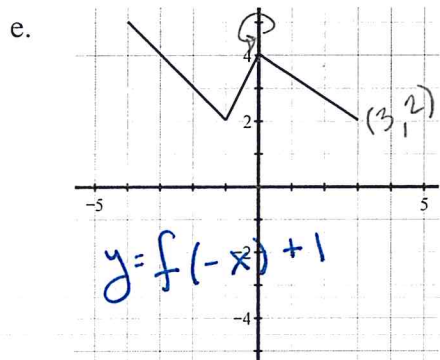
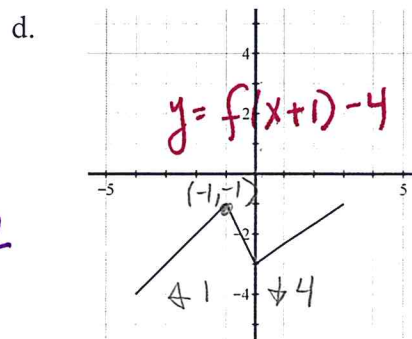
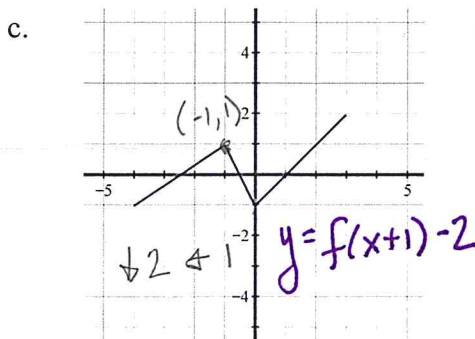
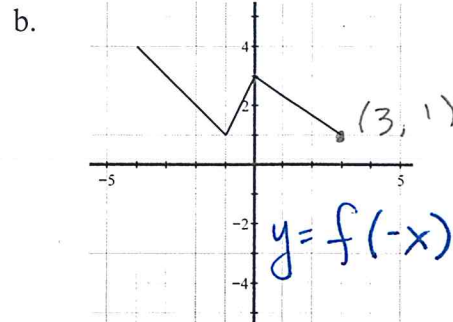
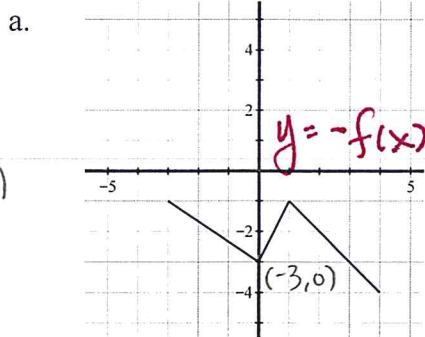
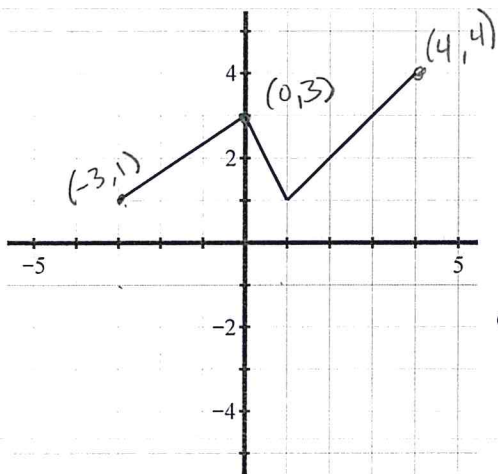
5. $y + 2 = f(-x)$ $y = f(-x) - 2$



6. $y = \frac{1}{2}f(x) - 3$



1. The graph of $y = f(x)$ is given below. Find the equation of each transformed graph.



2. Using the parent function $y = f(x)$, write an equation after the given transformations.

- a. Translated up 10 and left 3

$$y = f(x+3) + 10$$

- b. Reflected over the x -axis and the y -axis

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

- c. Reflected over the x -axis and translated up 7

$$y = -f(x) + 7$$

- d. Reflected over the y -axis and translated down 8

$$y = f(-x) - 8$$

- e. Reflected over the x -axis and translated right 5

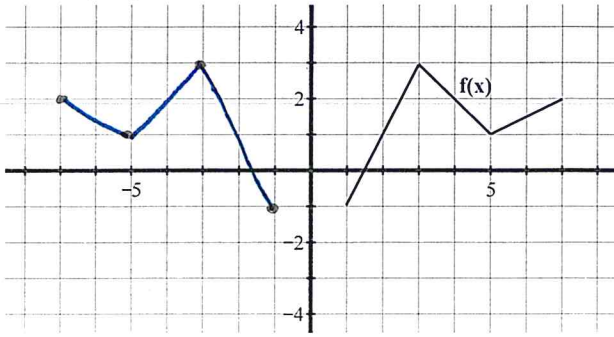
$$y = -f(x-5)$$

- Reflected over the y -axis and translated left 2

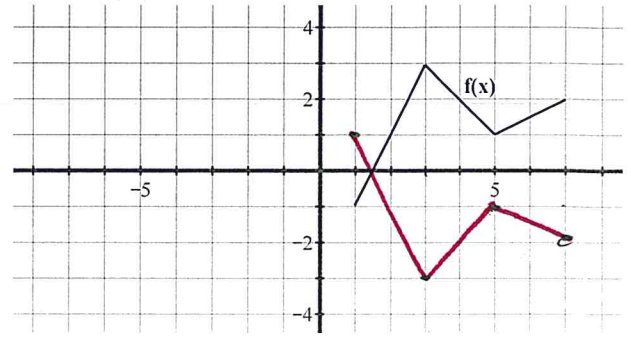
$$y = f(-(x+2))$$

3. Using the parent function $y = f(x)$, sketch each graph.

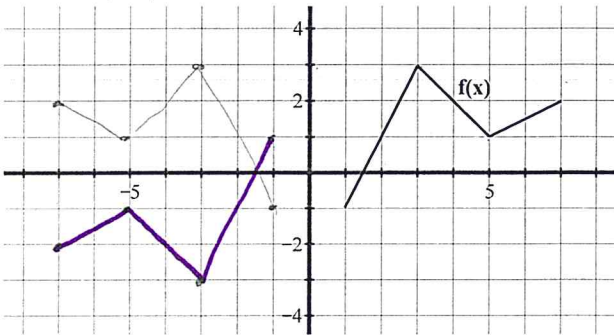
a. $y = f(-x)$



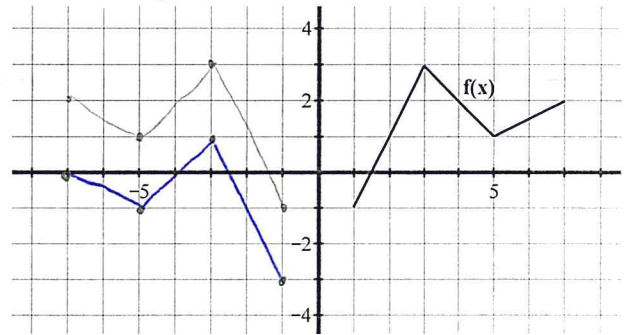
b. $y = -f(x)$



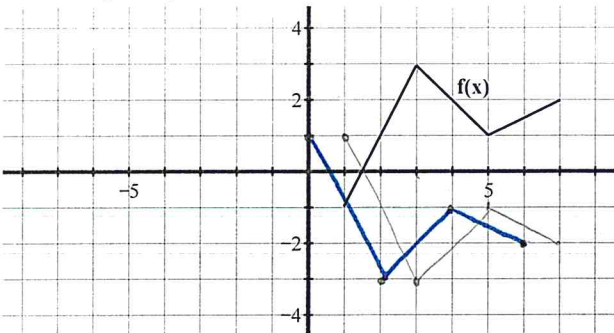
c. $y = -f(-x)$



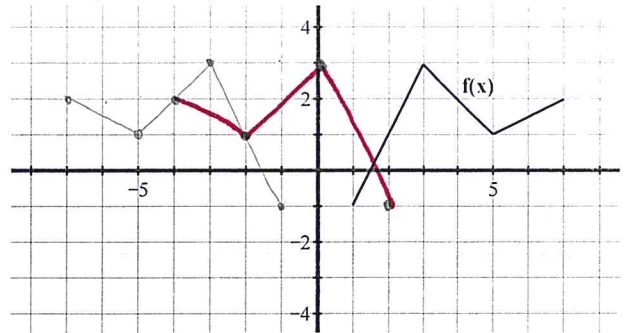
d. $y = -2 + f(-x)$



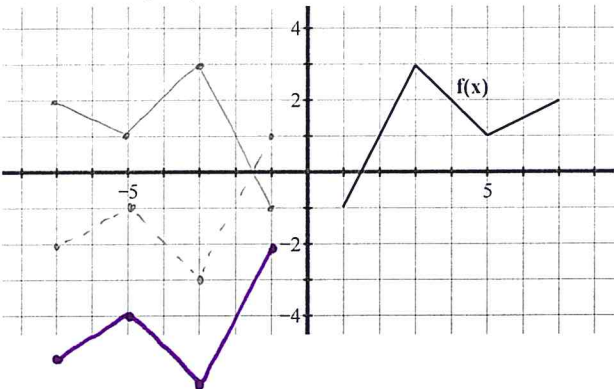
e. $y = -f(x+1)$



f. $y = f(-(x-3))$



g. $y = -3 - f(-x)$



h. $y = 2 - f(x-1)$

