

Directions: Write detailed descriptions for each transformation below.

A. $2f(x + 1) - 3$

Vertical stretch by 2
left 1
down 3

B. $-\frac{1}{3}f(x - 2) + 5$

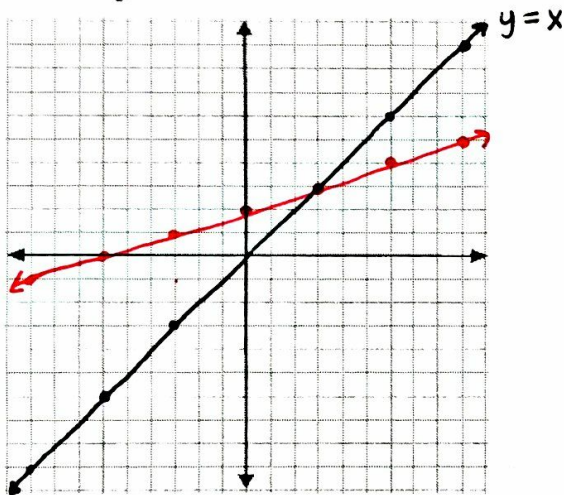
reflect over x-axis
vertical compression by $\frac{1}{3}$
right 2
up 5

Directions: Each description or graph represents a different transformation or combination of transformations of some "parent" function. Fill in the missing information.

1. Equation: $y = \frac{1}{3}x + 2$

Description: The graph of $y = x$ is shifted up 2 and is $\frac{1}{3}$ as tall.

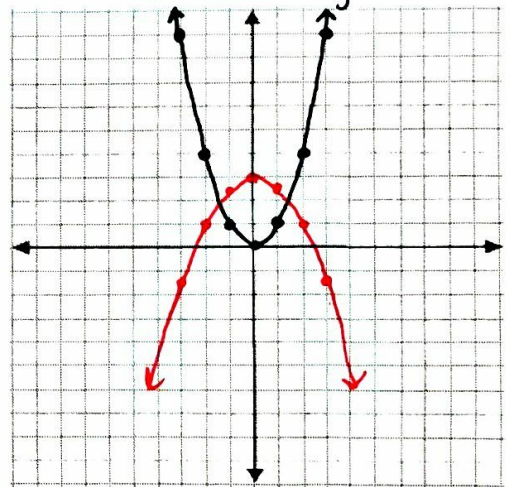
Graph:



2. Equation: $y = -\frac{1}{2}x^2 + 3$

Description: Reflect over x-axis. Vertical compression by $\frac{1}{2}$. Up 3

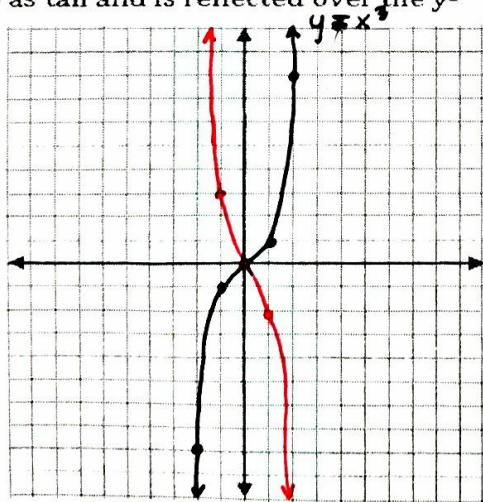
Graph:



3. Equation: $y = 2(-x)^3$

Description: The graph of $y = x^3$ is made twice as tall and is reflected over the y-axis.

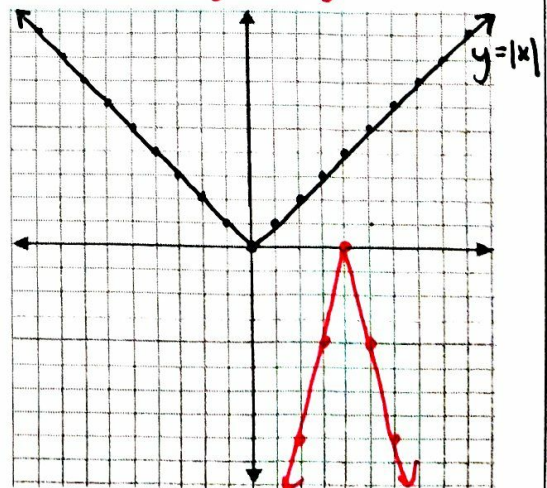
Graph:



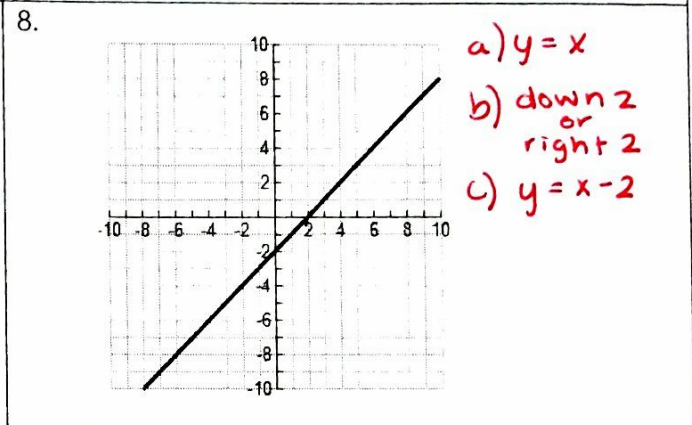
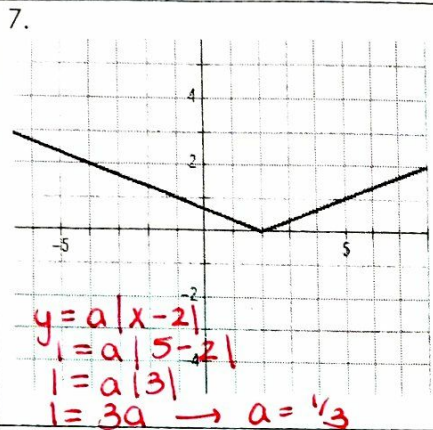
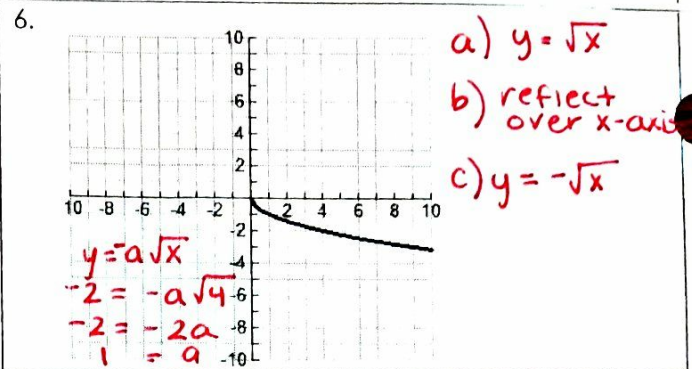
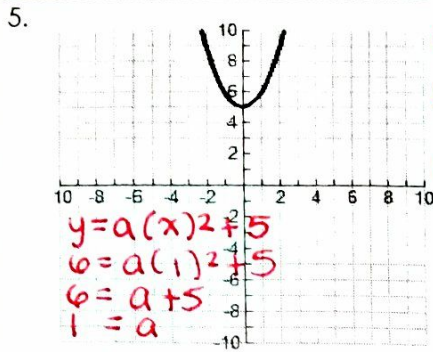
4. Equation: $y = -4|x - 4|$

Description: Reflect over x-axis. Vertical stretch by 4. Right 4.

Graph:



Directions: Each of the following figures is one of the basic graphs with one or more transformations performed on it. For each one, a. Identify the parent function, b. Describe in writing the transformation(s) that was/were performed. c. Write an equation for the new function



Directions: Answer the following.

9. How are the graphs of $y = x^2$ and $y = (x-3)^2$ related?
 right 3 units

10. What does the graph of $y = -2x^3$ look like?
 $y = x^3$ reflected over x-axis and vertically stretched by 2.

Optional Challenge:

Complete the table (Functions on top row, transformations on first column)

parent transform	$f(x) = x$	$f(x) = x^2$	$f(x) = \frac{1}{x}$	$f(x) = x $	$f(x) = \sin(x)$	$f(x) = \ln x$
$f(x) + 1$	$x + 1$	$x^2 + 1$	$\frac{1}{x} + 1$	$ x + 1$	$\sin(x) + 1$	$\ln(x) + 1$
$f(x) - 3$	$x - 3$	$x^2 - 3$	$\frac{1}{x} - 3$	$ x - 3$	$\sin(x) - 3$	$\ln(x) - 3$
$f(x+2)$	$x+2$	$(x+2)^2$	$\frac{1}{x+2}$	$ x+2 $	$\sin(x+2)$	$\ln(x+2)$
$f(x-4)$	$x-4$	$(x-4)^2$	$\frac{1}{x-4}$	$ x-4 $	$\sin(x-4)$	$\ln(x-4)$
$2f(x)$	$2x$	$2x^2$	$\frac{2}{x}$	$2 x $	$2\sin(x)$	$2\ln(x)$
$f(\frac{x}{2})$	$\frac{x}{2}$	$(\frac{x}{2})^2$	$\frac{2}{x}$	$ \frac{x}{2} $	$\sin(\frac{x}{2})$	$\ln(\frac{x}{2})$
$-f(2x+1)$	$-(2x+1)$	$-(2x+1)^2$	$\frac{-1}{2x+1}$	$- 2x+1 $	$-\sin(2x+1)$	$-\ln(2x+1)$