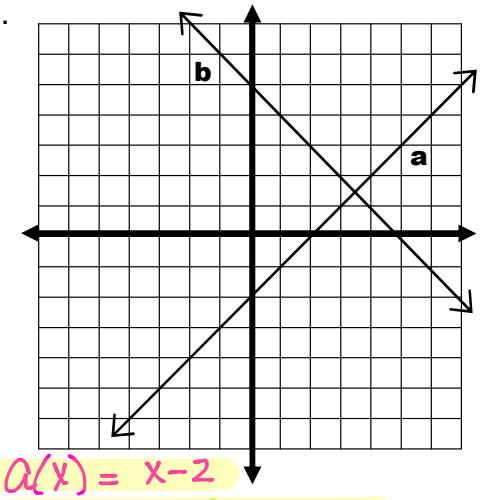
Grade: x/28

Name:_____

Parent Functions and Transformations

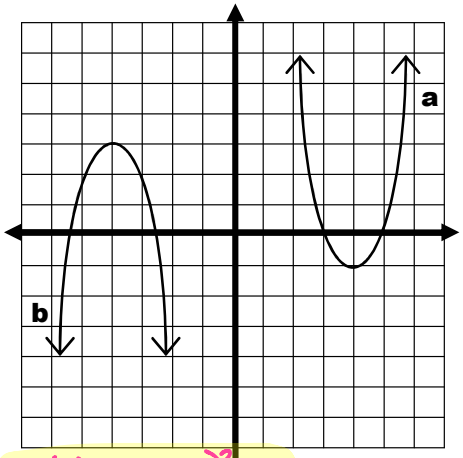
Using transformations, write the equation for each graph. Each grid line represents one unit.

1.



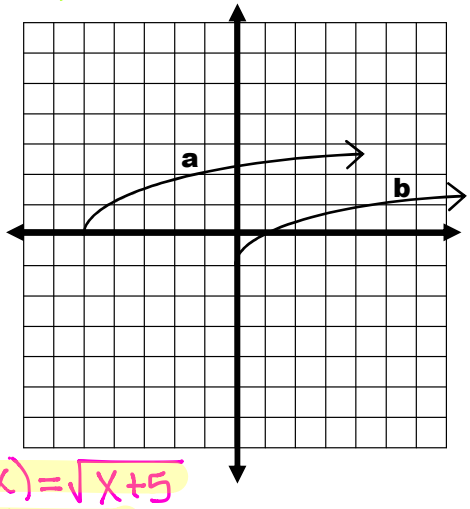
- $a(x) = x-2$
- $b(x) = -(x-5)$ or $-x+5$

2.



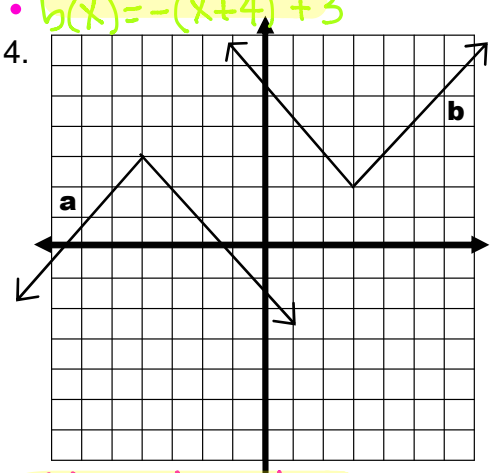
- $a(x) = (x-4)^2 - 1$
- $b(x) = -(x+4)^2 + 3$

3.



- $a(x) = \sqrt{x+5}$
- $b(x) = \sqrt{x} - 1$

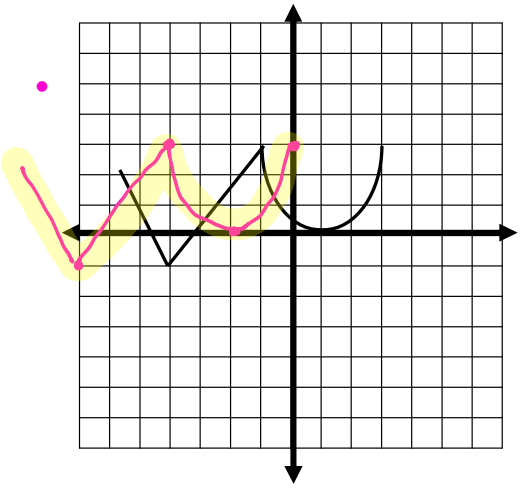
4.



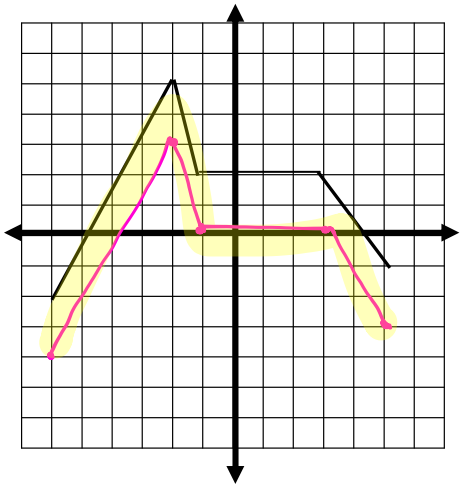
- $a(x) = -|x+4| + 3$
- $b(x) = |x-3| + 2$

For each function pictured below, draw the indicated transformation.

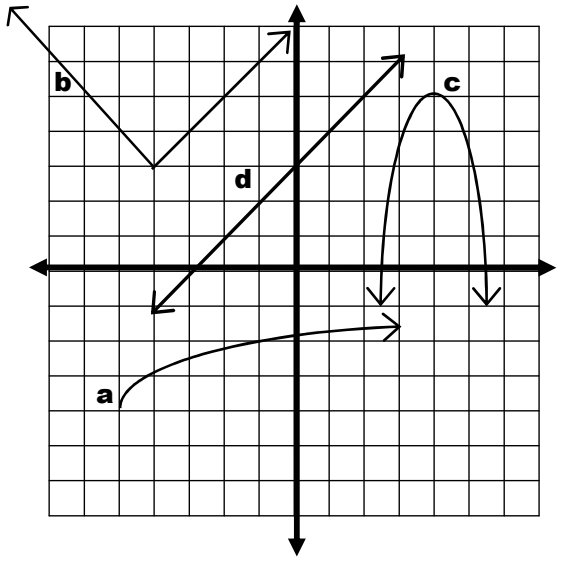
5. f(x – 3)



6. f(x) – 2



7. Name the parent function and write an equation for each graph.



	Parent function	Equation
a	Square Root or Radical	$f(x) = \sqrt{x+5} - 4$
b	Absolute value	$f(x) = \lvert x+4 \rvert + 3$
c	quadratic	$f(x) = -(x-4)^2 + 5$
d	linear	$f(x) = x + 3$

8. Your friend Caleb has called you long distance for some help on his algebra homework. He tells you that he has a picture of a graph of f(x) and he is supposed to graph f(x + 2) – 3, but he has no idea what to do because he does not know the equation of f(x). Help Caleb by explaining to him how he can graph this transformation. Remember, you are talking to Caleb on the phone so he cannot see anything you might draw.

Tell Caleb to take the important points from the f(x) graph & slide them to the Right 2 & down 3, then reconnect.

9. If $f(x) = \frac{x}{3} + 2$, $g(x) = -2x^2$, and $h(x) = (x-2)^2$, find each value.

a. f(g(-2))

$g(-2) = -8$

$\therefore f(g(-2)) = f(-8)$

$f(-8) = \frac{-8}{3} + 2$

$= \frac{-8}{3} + \frac{6}{3} = \frac{-2}{3}$

b. h(g(5))

$g(5) = -50$

$\therefore h(g(5)) = h(-50)$

$h(-50) = (-50-2)^2 = 2704$

c. g(f(x))

$f(x) = \frac{x}{3} + 2$

$\therefore g(f(x)) = -2\left(\frac{x}{3} + 2\right)^2$

10. Describe how each graph translates the graph of y = f(x).

a. y = f(x) + 5

shift 5 up

b. y = f(x) – 3

shift down 3

c. y = f(x – 2)

shift left 2

d. y = f(x + 6)

shift 6 Right

e. y = f(x + 4) – 2

shift Rt. 4 & down 2

f. y = 5 + f(x – 7)

shift up 5 & left 7