Saturday, October 07, 2017
9:20 AM

Name: KEY Date: _____ Period: _____

1.7 Transformations Practice

I. For each function below

a. Determine the parent function, $p(x)$

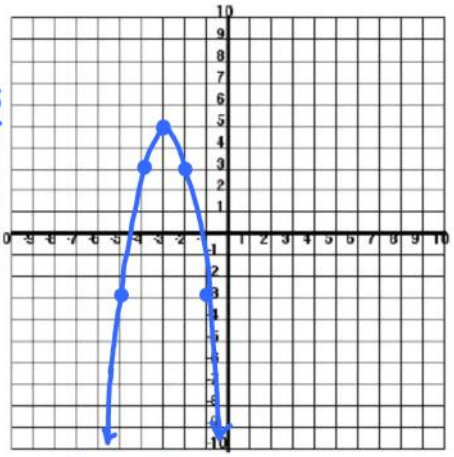
b. Describe the transformations from $p(x)$ performed to obtain $f(x)$.

c. Use these transformations to graph the new function.

x	y
-2	4
-1	1
0	0
1	1
2	4

1. $f(x) = -2(x+3)^2 + 5$ (2) (1) (3)

x-3	-2(y)	y+5
-5	-8	-3
-4	-2	3
-3	0	5
-2	-2	3
-1	-8	-3



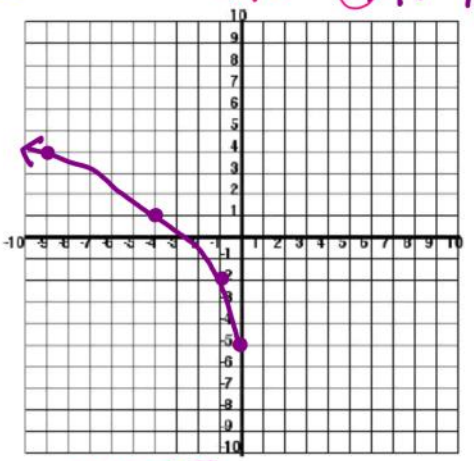
a. $p(x) = x^2$

b. Shift 3 left, reflect over X-axis, vertical stretch, Shift 5 up

2. $f(x) = 3\sqrt{-x} - 5$ (2) (1) (3)

x	y
0	0
1	1
4	2
9	3

x(-1)	3(y)	y-5
0	0	-5
-1	3	-2
-4	6	1
-9	9	4

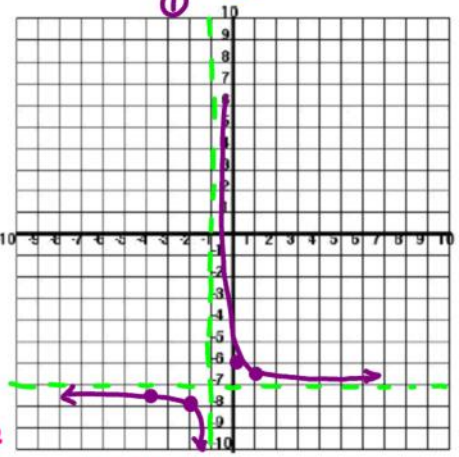


a. $p(x) = \sqrt{x}$

b. Reflect over y-axis, vertical stretch, shift 5 down.

3. $f(x) = \frac{1}{x+1} - 7$ (2) (1)

x	y
1	1
2	½
-1	-1
-2	-½



a. $p(x) = \frac{1}{x}$

b. shift left 1, 7 down

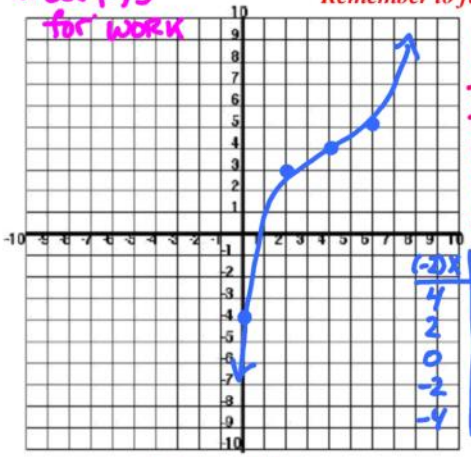
x-1	y-7
0	-6
1	-6.5
-2	-8
-3	-7.5

4. $f(x) = -\left(2 - \frac{1}{2}x\right)^3 + 4$ * (3) (1) (2) (3) (4)

$= -\left(-\frac{1}{2}(x-4)\right)^3 + 4$

Remember to factor first!

* See pg3 for work



x	y
-2	-8
-1	-1
0	0
1	1
2	8

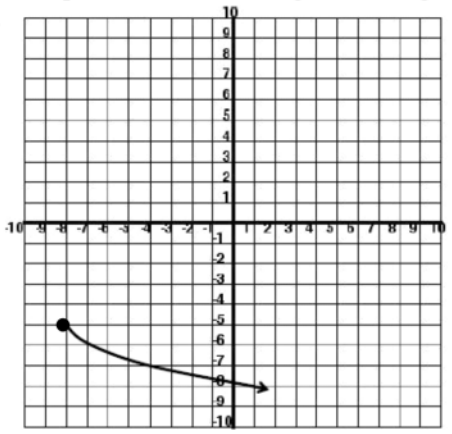
(-2)x	x+4	-1(y)	y+4
4	8	8	12
2	6	1	5
0	4	0	4
-2	2	-1	3
-4	0	-8	-4

a. $p(x) = x^3$

b. Reflect over y-axis, Horiz. stretch, shift 2 Rt, Reflect over X-axis, Shift up 4

II. Write the equation of the following functions, given the graphs.

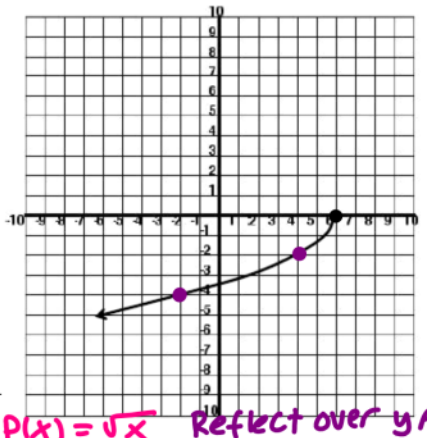
5.



$p(x) = \sqrt{x}$ Shift 8 left, Reflect over X-AXIS, Shift 5 down

$f(x) = -\sqrt{x+8} - 5$ * check on calc.

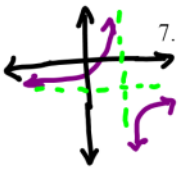
6.



$p(x) = \sqrt{x}$ Reflect over y Axis, Horiz compress by 2, Shift 6 RT, Reflect over X-Axis

$f(x) = -\sqrt{-2(x-6)} = -\sqrt{-2x+12}$

III. Write the equation of the following functions (make sure to use function notation), given the parent function and the transformations performed.



7. $p(x) = \frac{1}{x}$, vertically stretched by a factor of 7, reflected in the y–axis, translated 5 units to the right, and translated 3 units down.

$f(x) = 7\left(-\frac{1}{x-5}\right) - 3$

$f(x) = \frac{-7}{x-5} - 3$

8. $p(x) = x^2$, horizontally compressed (shrunk) by a factor of $\frac{1}{3}$, reflected in both the x–axis and the y–axis, translated 12 units to the left and 4 units up.

$f(x) = -(-3(x+12))^2 + 4$

$f(x) = -(-3x-36)^2 + 4$

9. $p(x) = \sqrt{x}$, vertically stretched by a factor of 2, horizontally stretched by a factor of 5, and translated 20 units to the right.

$f(x) = 2\sqrt{\frac{1}{5}(x-20)}$

$f(x) = 2\sqrt{\frac{1}{5}x - 4}$

IV. State the Domain and Range for both the original function and the transformed function for each part of question III. Use *Interval Notation*.

	Original Domain	Original Range	Transformed Domain	Transformed Range
7.	$(-\infty, 0) \cup (0, \infty)$	$(-\infty, 0) \cup (0, \infty)$	$(-\infty, 5) \cup (5, \infty)$	$(-\infty, -3) \cup (-3, \infty)$
8.	$(-\infty, \infty)$	$[0, \infty)$	$(-\infty, \infty)$	$(-\infty, 4]$
9.	$[0, \infty)$	$[0, \infty)$	$[20, \infty)$	$[0, \infty)$

4. $f(x) = -\left(2 - \frac{1}{2}x\right)^3 + 4$

$= -\left(-\frac{1}{2}x + 2\right)^3 + 4$

$= -\left(-\frac{1}{2}(x - 4)\right)^3 + 4$