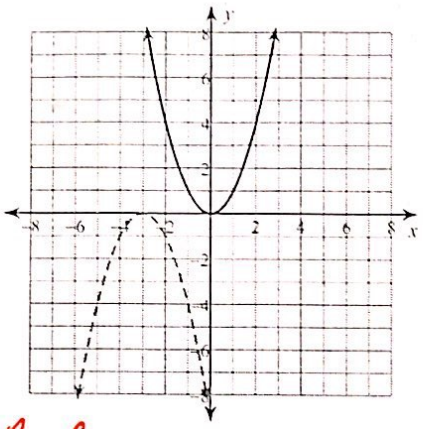
Kuta Software - Infinite Precalculus Notes Name _____

Transformations of Graphs

Date _____ Period 2

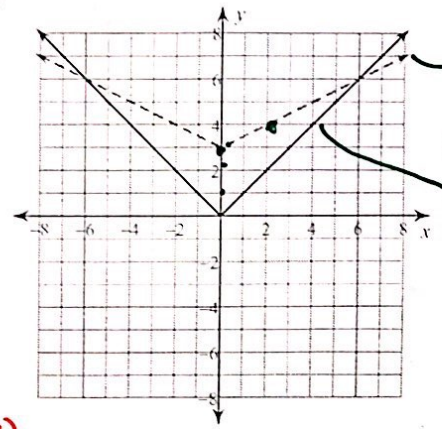
Describe the transformations necessary to transform the graph of $f(x)$ (solid line) into that of (dashed line).

1)



1) Ref. over x-axis
2) Left 3 units

2)



slope (new) $\frac{1}{2}$

slope (orig.) 1

1) vert. compression by factor of 2
2) up 3 units

Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

3) $f(x) = \sqrt{x}$
$g(x) = -3\sqrt{x} - 1$

down 1 unit
Reflect over x-axis
Vert. Stretch by factor of 3

4) $f(x) = x^3$
$g(x) = 3(x+1)^3$

cubic

Vert. Stretch by a factor of 3
Left 1 unit.

Transform the given function $f(x)$ as described and write the resulting function as an equation.

5) $f(x) = x^2$
expand vertically by a factor of 3
translate down 3 units

$g(x) = 3x^2 - 3$
or
$g(x) = 3(x)^2 - 3$

6) $f(x) = \frac{1}{(x)}$
compress horizontally by a factor of 2
translate left 3 units

$g(x) = \frac{1}{2(x+3)}$ or $\frac{1}{2x+6}$

7) $f(x) = |x|$
expand horizontally by a factor of 2
translate right 1 unit
translate up 3 units

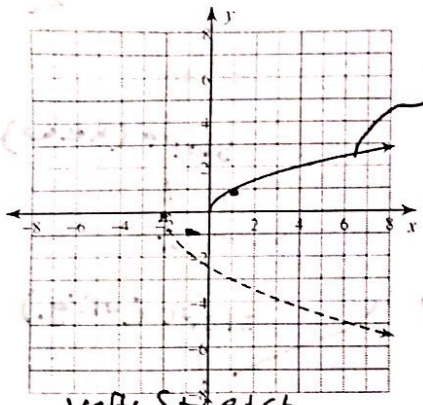
$g(x) = \left|\frac{1}{2}(x-1)\right| + 3$

8) $f(x) = \sqrt{x}$
compress vertically by a factor of 3 $\frac{1}{3}$ out
reflect across the x-axis -, out
translate right 2 units -2, in
translate down 3 units -3, out

$g(x) = -\frac{1}{3}\sqrt{x-2} - 3$

Write $g(x)$ (dashed line) in terms of $f(x)$ (solid line).

9)



$f(x)=\sqrt{x}$

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

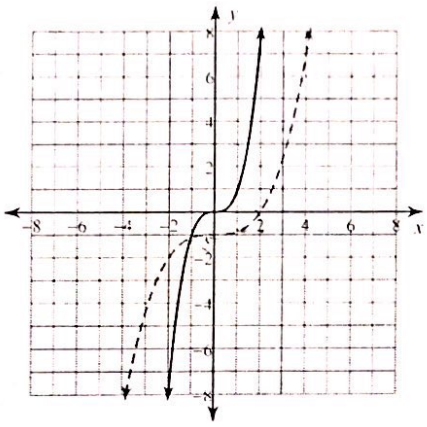
Vert. Stretch

$-2\sqrt{x+2}$

Left 2 units

flip over x-axis

10)

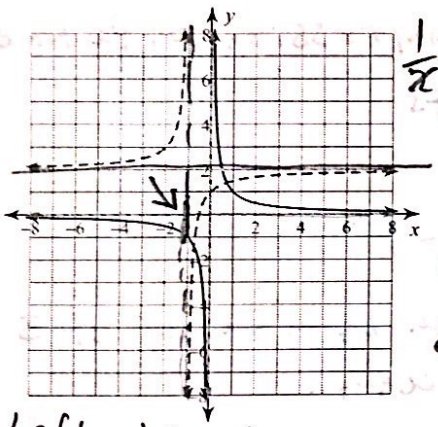


down

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

Horiz. Stretch by factor of 2

11)



$\frac{1}{x}-f(x)$

Left

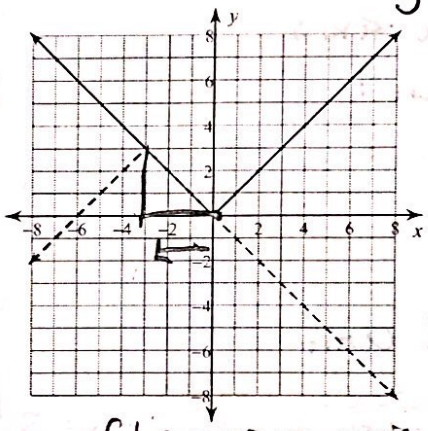
$f(x+1)+2$

UP

Left 1 unit

UP 2 units

12)



$f(x)=|x|$

Left

$g(x)=-f(x+3)+3$

flip

UP

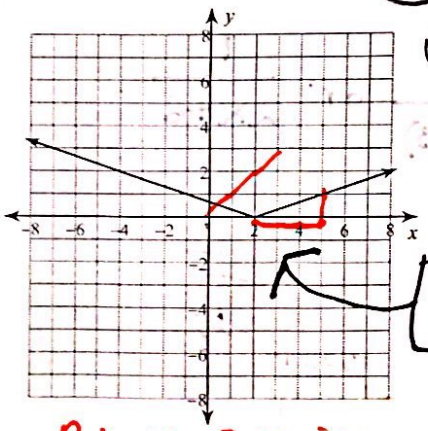
flip over x-axis

Left 3

UP 3

Identify the parent function $f(x)$ and write an equation for the function given.

13)



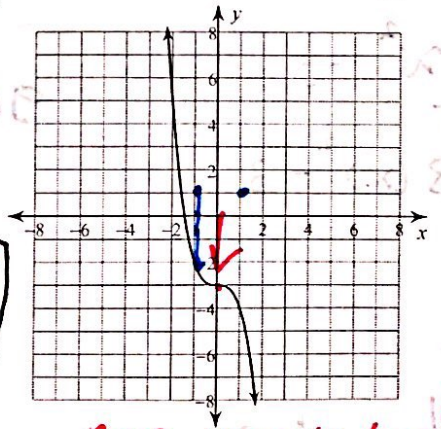
$f(x)=|x|$

$g(x)=\frac{1}{3}|x-2|$

Right 2 units

Vert. comp. by factor of 3

14)



$f(x)=x^3$

$g(x)=-(x)^3-3$

Ref. x-axis (- out)

Down 3 units