Pre-Calculus Chapter 1
Review- Miller 2016

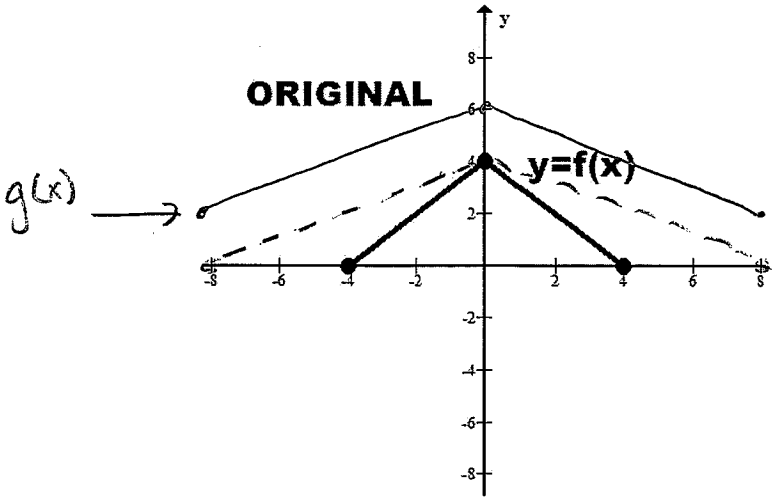
Name: Key
Hour: _____

1. Use the graph of f(x) to graph g(x).

$g(x) = f\left(\frac{1}{2}x\right) + 2$

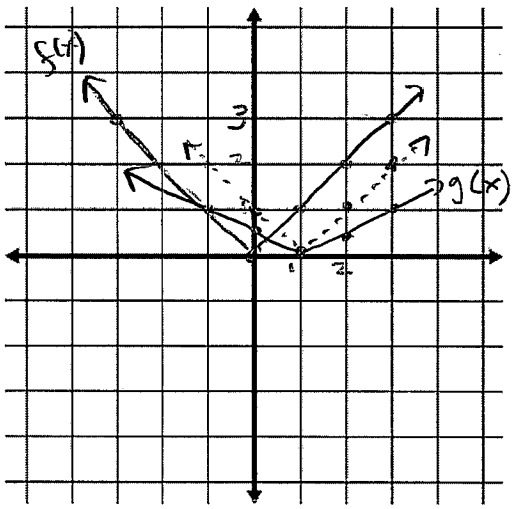
V. shift up 2

H. Stretch * x-values by $\frac{1}{(1/2)} = *2$



2. Graph $f(x) = |x|$

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



4. Explain in words the translation from $f(x) \to g(x)$

① Horiz. Shift right 1 unit

② V. shrink by 1/2

#5-8: Given $f(x) = 3x - 1$ and $g(x) = x^2 - x - 6$

5-6. Find $f - g$

$3x - 1 - (x^2 - x - 6)$

$3x - 1 - x^2 + x + 6$

$(f-g)(x) = -x^2 + 4x + 5$

Find the domain $(-\infty, \infty)$

7-8. Find $\frac{f}{g}$ $\quad \frac{3x-1}{x^2-x-6} = \frac{3x-1}{(x-3)(x+2)}$

Find the domain $(-\infty, -2) \cup (-2, 3) \cup (3, \infty)$

Exclude $x = 3$ $x = -2$

9-10: Given that $f(x) = x^2 + 1$ and $g(x) = \sqrt{2-x}$,

Find $(f \circ g)(x)$.

$f(g(x)) = (\sqrt{2-x})^2 + 1 = 2 - x + 1$

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

You must check the domain of g(x)

Find the domain of $(f \circ g)(x)$.

$2 - x \geq 0$

$-x \geq -2$

$x \leq 2$

D: $(-\infty, 2]$

11-12. Find $f(g(x))$ *and* $g(f(x))$ and determine wheather the pair of functions given below are inverses of eachother.

$f(x)=5x+2$ and $g(x)=\frac{x-2}{5}$.

$f(g(x))$

$5\left(\frac{x-2}{5}\right)+2 = x-2+2 = x$

$g(f(x))$

$\frac{(5x+2)-2}{5} = \frac{5x}{5} = x$

Since both equal x, they are inverses of each other.

13-14. Given $f(x)=(x-2)^2, x\geq 2$

a. Find the equation for $f^{-1}(x)$

$x=(y-2)^2$

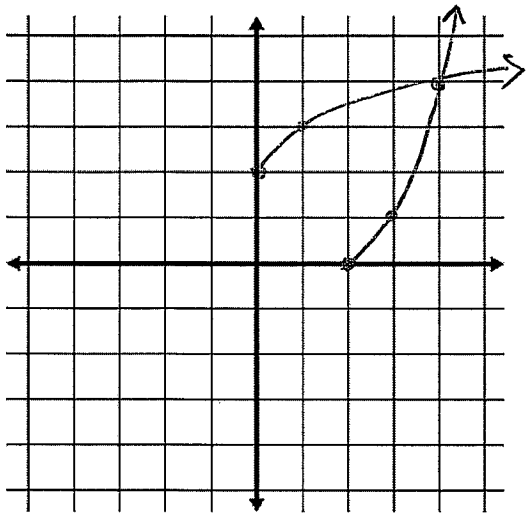
$\sqrt{x}=y-2$

$+2 \quad +2$

$y=\sqrt{x}+2$

$f(x)$	
x	y
2	0
3	1
4	4

$f^{-1}(x)$	
x	y
0	2
1	3
4	4



b. Graph f *and* f^{-1} in the same rectangular coordinate system.

A. A 400 room hotel can rent every one of its rooms at \$120 per room. For each \$1 increase in rent, two fewer rooms are rented.

a. Express the number of rooms rented, N, as a function of the rent x. $N(x)=400-2(x-120)$

$400-2x+240$

$N(x)=-2x+640$

b. Express the hotels revenue, R, as a function of the rent, x. $R(x)=x(-2x+640)$

$R(x)=-2x^2+640x$

B. You inherit \$10,000 with the stipulation that for the first year the money must be placed in two investments expected to earn 8% and 12% annual interest.

a. Express the expected interest from both investments I, as a function of the amount of money invest in the 8%, x.

$I(x)=0.08x+0.12y$

$0.08x+0.12(10000-x)$

$0.08x-0.12x+1200$

$10000=x+y$

$y=10000-x$

$I(x)=-0.04x+1200$

b. If the total interest for the year was \$1,088, how much money was invested at each rate?

$1088=-0.04x+1200$

$-1200 \quad -1200$

$-112=-0.04x$

\$2800 in the 8% account AND \$7200 in the 12% account

C. You have 600 yards of fencing to enclose a rectangular field. Express the area of the field, A, as a function of one of its dimensions, x.

$P=600$ yds

$600=2x+2y$

$600-2x=2y$

$y=300-x$

$A(x)=x(300-x)$

$A(x)=300x-x^2$ or $-x^2+300x$

D. The sum of two positive numbers is 86. Write a function that models the product of the two numbers in terms of one of the numbers, x.

$x+y=86$

$x\geq 0 \quad y\geq 0$

$P(x)=x(86-x)$

$P(x)=86x-x^2$

$-x^2+86x$