Algebra 2 Honors **Name**_____
Notes: 6.4 **Date**_____ **Block**_____

Transforming Piecewise Functions

Transform piecewise functions by applying transformations to each piece of the function independently.
Caution

Example #1 Transforming Piecewise Functions

Given $f(x)=\begin{cases}-\frac{1}{2}x, & x<0\\ \frac{1}{2}x^2, & x\geq 0\end{cases}$ write the rule for $g(x)$, a vertical stretch by a factor of 3.

Example #2

Given $f(x)=\begin{cases}x+3 & x>0\\ 2x+3, & x\leq 0\end{cases}$ write the rule for $g(x)$, a horizontal translation of $f(x)$ 4 units right.

Check it Out! Example #1

Given $f(x)=\begin{cases}x^2, & x\leq 1\\ x-3, & x>1\end{cases}$ write the rule for $g(x)$, a horizontal stretch of $f(x)$ by a factor of 2.

Check it Out! Example #2

Given $f(x)=\begin{cases}x-3, & x\leq 0\\ 4x, & x>0\end{cases}$ write the rule each function described.

a. $g(x)$, a horizontal translation of $f(x)$ 6 units left

b. $h(x)$, a horizontal compression of $f(x)$ by a factor of $\frac{1}{4}$

c. $p(x)$, a vertical translation of $f(x)$ 3 units down

Transforming Piecewise Functions

When functions are transformed, the intercepts may or may not change. By indentifying the transformations, you can determine the intercepts, which can help you graph a transformed function.

Example #3 Identifying Intercepts

Identify the *x*- and *y*-intercepts of *f*(*x*). Without graphing *g*(*x*), identify its *x*- and *y*-intercepts.

(A) $f(x) = -2x - 4;\ g(x) = f\left(\frac{1}{2}x\right)$

(B) $f(x) = x^2 - 1; g(x) = f(-x)$

Check it Out! Example #3

Identify the *x*- and *y*-intercepts of *f*(*x*). Without graphing *g*(*x*), identify its *x*- and *y*-intercepts

(A) $f(x) = \frac{2}{3}x + 4; g(x) = -f(x)$

(B) $f(x) = x^2 - 9; g(x) = \frac{1}{3}f(x)$

Example #4 Problem Soling Application

Coco's Coffee charges different prices based on the number of pounds purchased. The pricing scale is modeled by the function below, where *w* is the weight in pounds purchased.

$$p(w) = \begin{cases} 9w, & 0 < w < 3 \\ 27 + 7.5(w-3), & 3 \le w < 6 \\ 49.5 + 6(w-6), & w \ge 6 \end{cases}$$

Orders placed directly through the website are discounted by $\frac{1}{3}$, but a shipping fee of $2.50 is added. Write a pricing function for orders placed through the website.