Name _____ **Date** _____ **Class** _____

Homework 3.6

For questions 1 – 4, refer to the table of values to the right.

x	f	f'	g	g'
−3	−1	2	1	$-\frac{1}{2}$
1	2	3	0	−2
2	−3	$\frac{2}{5}$	−2	−6

f^{-1}	g^{-1}
$(-1,-3)$	$(1,-3)$
$(2,1)$	$(0,1)$
$(-3,2)$	$(-2,2)$

1. Find the value of $[f^{-1}(2)]'$.

$$\left[f^{-1}(x)\right]' = \frac{1}{f'\left[f^{-1}(x)\right]}$$

$$\left[f^{-1}(2)\right]' = \frac{1}{f'\left[f^{-1}(2)\right]}$$

$$= \frac{1}{f'(1)}$$

$$= \frac{1}{3}$$

2. Find the value of $[g^{-1}(1)]'$

$$\left[g^{-1}(x)\right]' = \frac{1}{g'\left[g^{-1}(x)\right]}$$

$$\left[g^{-1}(1)\right]' = \frac{1}{g'\left[g^{-1}(1)\right]}$$

$$= \frac{1}{g'(-3)}$$

$$= \frac{1}{-\frac{1}{2}}$$

$$= -2$$

3. Find the equation of the line tangent to the graph of g^{-1} when $x = -2$.

PoT $(-2,2)$	SoT : $m = -\frac{1}{6}$	Tangent line
Table	$\left[g^{-1}(x)\right]' = \frac{1}{g'\left[g^{-1}(x)\right]}$ $\left[g^{-1}(-2)\right]' = \frac{1}{g'\left[g^{-1}(-2)\right]}$ $= \frac{1}{g'(2)}$ $= \frac{1}{-6}$	$y - 2 = -\frac{1}{6}(x+2)$

4. If $h(x) = g(f(x))$, what is the equation of the line normal to the graph of h when $x = 2$?

PoN $(2,1)$

$h(2) = g(f(2))$

$= g(-3)$

$h(2) = (1)$

SoN: $m = 5$

$h'(x) = g'(f(x)) \cdot f'(x)$

$h'(2) = g'(f(2)) \cdot f'(2)$

$= g'(-3) \cdot \frac{2}{5}$

$= -\frac{1}{2} \cdot \frac{2}{5}$

$h'(2) = -\frac{1}{5}$

Tangent line

$y - 1 = 5(x-2)$