Free Response Practice #11
Calculator NOT Permitted

x	–4	–1	0	1	4
$f(x)$	3	5	2	5	3
$g(x)$	–3	–2	0	2	3

The graphs of $f(x)$ and $g(x)$ are piecewise defined functions that consist of connected, linear pieces and whose domains are each [–4, 4]. Answer the following questions about the functions.

a. If $p(x) = x^2 - 3x - 1$, then for what value(s) of x is $p(x) = [f(1) - 2 \cdot g(-1)]$? Show your work.

$x^2-3x-1 = [f(1) - 2\cdot g(-1)]$
$= 5 - 2(-2)$
$= 5+4$ +1
$x^2-3x-1 = 9$

$x^2-3x-1 = 9$
$x^2-3x-10 = 0$
$(x-5)(x+2) = 0$ +1
$x-5=0$ | $x+2=0$
$x=5$ | $x=-2$

b. Determine if $f(x)$ and $g(x)$ are even, odd, or neither? Give numerical reasons for your answers.

+1 $f(x)$ is even b/c for every point (x,y), there exists point $(-x,y)$.

+1 $g(x)$ is odd b/c for every point (x,y), there exists point $(-x,-y)$

c. If $p(x) = 2g(-x+3) - 4$, the point $(-4, -3)$ on the graph of $g(x)$ would correspond with what point on on the graph of $p(x)$? Explain your reasoning.

$p(x) = 2g[-(x-3)] - 4$

$p(x)$'s graph would take $g(x)$'s graph & reflect in horizontally about y-axis, dilate it vertically by 2, Translate it right 3 and down 4. +1

$g(x) \rightarrow p(x)$
$(x,y) \rightarrow (-x+3, 2y-4)$
$(-4,-3) \rightarrow (4+3, 2(-3)-4)$ +1
$\rightarrow (7, -6-4)$
$(-4,-3) \rightarrow (7,-10)$

d. If $h(x) = 3f(x) - g(x)$, represent $h(x)$ numerically in a table of values. Does $h^{-1}(x)$ exist and give a reason for your answer.

x	–4	–1	0	1	4
$h(x)$	12	17	6	13	6

+1

$h(0) = 6$ and $h(4) = 6$ } +1
$\therefore$ $h(x)$ is not 1-1 }
$\therefore$ $h^{-1}(x)$ does not exist +1