Name _____ Discrete I, Quiz 6

1) Let $f(x) = x + 2$, $g(x) = x^2$, and $h(x) = 3x$. Find and simplify $f\left(g\left(h(x)\right)\right)$

$$f\left(g\left(h(x)\right)\right) = f\left(g(3x)\right) = f((3x)^2) = f(9x^2) = 9x^2 + 2$$

2) Provide justification that the relation R on $\mathbb{Z}$ defined by xRy if and only if $2|(x - y)$ is reflexive. You can provide this justification with either a mathematical proof or a clear explanation.

Reflexive is asking us whether or not a number n is related to itself. To check this let's plug in n for both x and y and see what happens:

$$x - y = n - n = 0$$

It looks like indeed, R is reflexive because $2|0$ which is $2|(n - n)$.