Functions Cover Page; What I know and can do

Question	First Day	Last Day
What is a function?		an expression that shows the relationship between an input + output
If $f(x) = 2g(x) - 3$ and $f(2) = 5$ then what point must be on g? (*reasoning*)		$g(2) = 4 \leftrightarrow (2,4)$ $f(2) = 5 = 2g(2) - 3$ $8 = 2g(2)$ $4 = g(2)$
What is a composition of functions?		combination of functions where output becomes a new input.
In general, why does $f(a+b) \neq f(a) + f(b)$ (*reasoning & solving*)		$a(x) = x \quad b(x) = 2x$ $f(x) = \sqrt{x}$ $f(a+b) = \sqrt{3x} \neq \sqrt{x} + \sqrt{2x}$
What is a translation?		moving the graph (space) left/right by x_0 and up/down by y_0

How has space been transformed if $(x, y) \mapsto (x - 2, y + 3)$ (*solving*)		shifted left 2 and up 3
What is a reflection or stretch?		changing the x/y values through multiplication a reflection is when we multiply by -ve
If the following transformation occurred to f $g(x) = 2f(3x)$ And f had a maximum at the point $(6,12)$, where would g have a max or min? (*reasoning*)		⇔ horiz comp by 3 ↕ vertical exp by 2 $(6,12) \mapsto (2, 24)$ new max
What is an inverse?		The reverse of a function $f: X \to Y$ $f^{-1}: Y \to X$
Determine the inverse of the following function (assume function g and h have inverses) $f(x) = 2g\left(\frac{h(x) - 1}{3}\right)$ (*communication*)		$g^{-1}\left(\frac{y}{2}\right) = \left(\frac{h(x) - 1}{3}\right)$ $h^{-1}\left(3g^{-1}\left(\frac{y}{2}\right) + 1\right) = (x)$ $f^{-1}(x) = h^{-1}\left(3g^{-1}\left(\frac{x}{2}\right) + 1\right)$