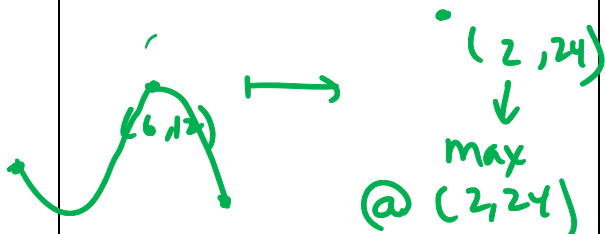


# Functions Cover Page; What I know and can do

Question	First Day	Last Day
What is a function?		<p>an action that transforms something into something else.</p> <p>a relationship between two sets. Everything in the domain has exactly 1 connect.</p>
<p>If <math>f(x) = 2g(x) - 3</math> and <math>f(2) = 5</math> then what point must be on <math>g</math>?</p> <p>(reasoning)</p>		<hr/> <p><math>x = 2</math></p> <p><math>f(2) = 5 = 2g(2) - 3</math></p> <p><math>8 = 2g(2)</math></p> <p><math>4 = g(2) \Rightarrow (2, 4)</math></p>
What is a composition of functions?		<p><math>f(g(x))</math></p> <p>put the output on one function into another function</p>
<p>In general, why does <math>f(a + b) \neq f(a) + f(b)</math></p> <p>(reasoning &amp; solving)</p>		<p><math>a+b \xrightarrow{f} f(a+b)</math></p> <p>These are different things</p> <p><math>\begin{matrix} a \xrightarrow{f} f(a) \\ b \xrightarrow{f} f(b) \end{matrix}</math> add</p>
What is a translation?		<p>when we shift the graph/space horiz. and/or vert.</p>

<p>How has space been transformed if  <math>(x, y) \mapsto (x - 2, y + 3)</math></p> <p>(solving)</p>		<p>left 2 units  up 3 units</p>
<p>What is a reflection or stretch?</p>		<p>stretch <math>\Rightarrow</math> expand or compress space horiz. vert.  reflect <math>\Rightarrow</math> mirror image over x/y axis</p>
<p>If the following transformation occurred to <math>f</math>  <math>g(x) = 2f(3x)</math></p> <p>And <math>f</math> had a maximum at the point <math>(6, 12)</math>, where would <math>g</math> have a max or min?</p> <p>(reasoning)</p>		<p>vert. exp by 2  horiz. comp by 3</p> 
<p>What is an inverse?</p>		<p>a function s.t  <math>f(f^{-1}(x)) = x = f^{-1}(f(x))</math>  <math>\rightarrow</math> x and y swap + reflect over <math>y=x</math>  <math>f: x \mapsto y</math>    <math>f^{-1}: y \mapsto x</math></p>
<p>Determine the inverse of the following function (assume function <math>g</math> and <math>h</math> have inverses)  <math>f(x) = 2g\left(\frac{h(x) - 1}{3}\right)</math></p> <p>(communication)</p>		<p>(<math>\star</math> reverse operations of the function)</p> $3g^{-1}\left(\frac{y}{2}\right) = h(x) - 1$ $h^{-1}\left(3g^{-1}\left(\frac{y}{2}\right) + 1\right) = x$

$$f^{-1}(x) = h^{-1}\left(3g^{-1}\left(\frac{x}{2}\right) + 1\right)$$

