

Topic/Skill	Definition/Tips	Example
1. Function Machine	Takes an <b>input</b> value, performs some <b>operations</b> and produces an <b>output</b> value.	
2. Function	A <b>relationship</b> between two sets of values.	$f(x) = 3x^2 - 5$ 'For any input value, square the term, then multiply by 3, then subtract 5'.
3. Function notation	$f(x)$ $x$ is the <b>input</b> value $f(x)$ is the <b>output</b> value.	$f(x) = 3x + 11$ Suppose the input value is $x = 5$ The output value is $f(5) = 3 \times 5 + 11 = 26$
4. Inverse function	$f^{-1}(x)$ A function that performs the <b>opposite process</b> of the original function.  1. Write the function as $y = f(x)$ 2. Rearrange to make $x$ the subject. 3. Replace the <b>y with x</b> and the <b>x with <math>f^{-1}(x)</math></b>	$f(x) = (1 - 2x)^5$ . Find the inverse.  $y = (1 - 2x)^5$ $\sqrt[5]{y} = 1 - 2x$ $1 - \sqrt[5]{y} = 2x$ $\frac{1 - \sqrt[5]{y}}{2} = x$  $f^{-1}(x) = \frac{1 - \sqrt[5]{x}}{2}$
5. Composite function	A <b>combination</b> of two or more <b>functions</b> to create a new function. $fg(x)$ is the composite function that <b>substitutes</b> the function $g(x)$ <b>into</b> the function $f(x)$ .  $fg(x)$ means ' <b>do g first, then f</b> ' $gf(x)$ means ' <b>do f first, then g</b> '	$f(x) = 5x - 3, g(x) = \frac{1}{2}x + 1$ What is $fg(4)$ ? $g(4) = \frac{1}{2} \times 4 + 1 = 3$ $f(3) = 5 \times 3 - 3 = 12 = fg(4)$  What is $fg(x)$ ? $fg(x) = 5\left(\frac{1}{2}x + 1\right) - 3 = \frac{5}{2}x + 2$