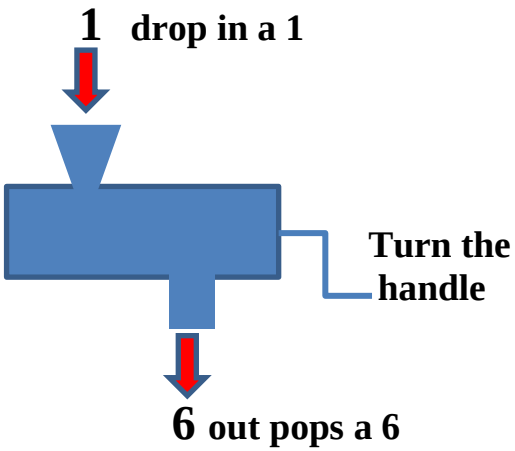
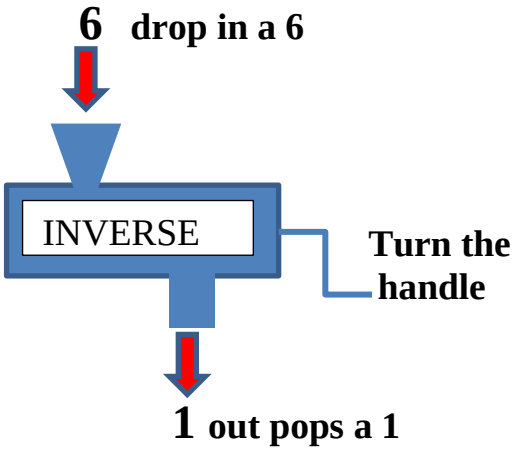
What is an inverse function?

If you have an equation for example **y = 2x + 4** we can think of this as a formula for **changing x values into y values**.
For instance: If x = 1 then y = 2 + 4 = 6

Think of it as a machine like this…



An **INVERSE** FUNCTION would be an equation to **change 6 back into 1**

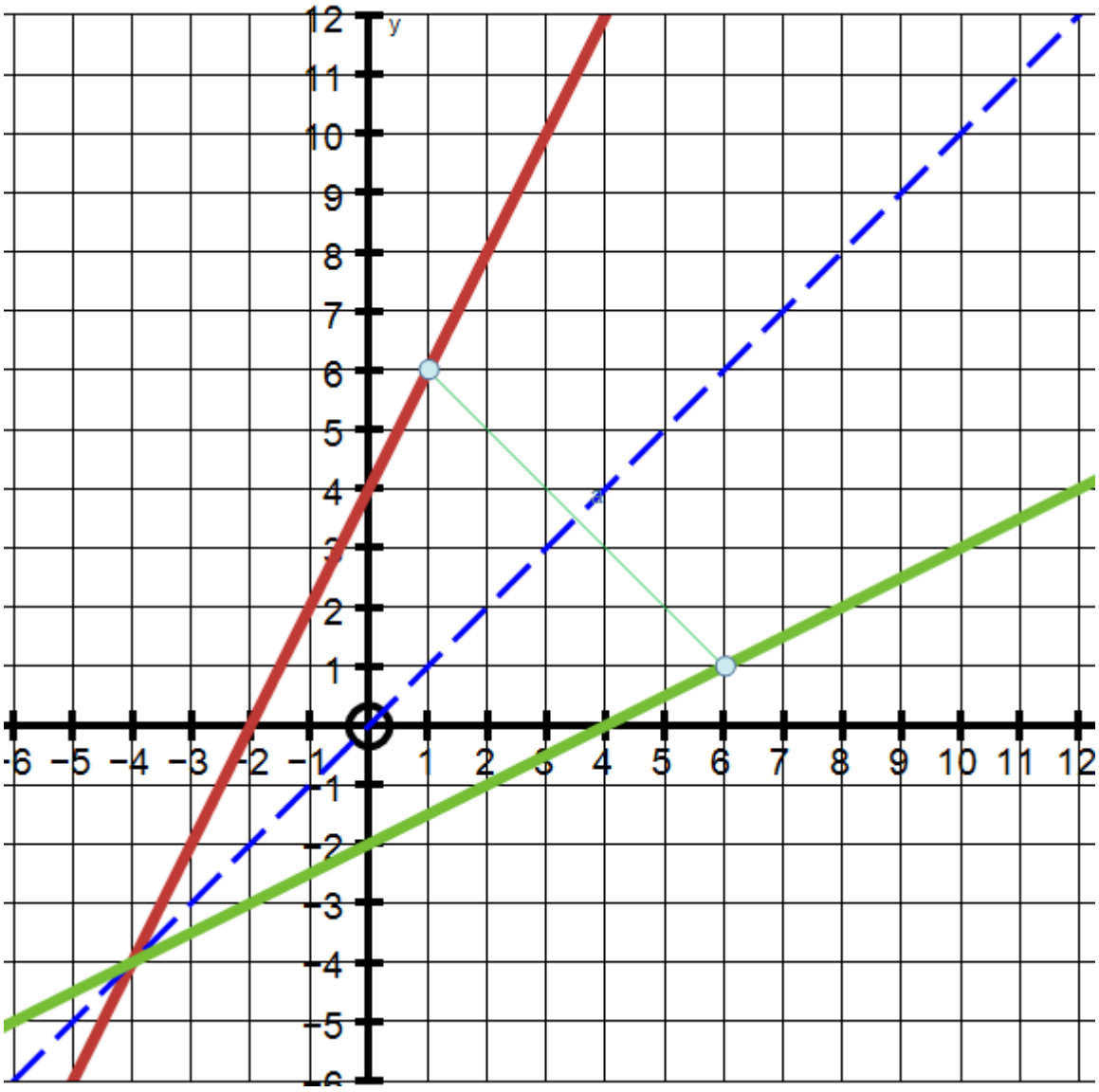


An algebraic method to do this would be to change the equation so that its subject is **x**

If **y = 2x + 4**
then **y – 4 = 2x**
so $\mathbf{x = \frac{y - 4}{2}}$

Just testing it…..if **y = 6** then **x =** $\frac{\mathbf{6 - 4}}{\mathbf{2}}$ which does equal **1** again!

If we think of **x = 1, y = 6** as a point **(1, 6)** on a graph
then the **inverse point** would be **(6, 1)** which is the **reflection of (1, 6) in the line y = x**



Since these two functions can be thought of as graphs, we usually express each in the form of **y = f(x)** and the inverse as **y = $\mathbf{f^{-1}(x)}$**

I this case **y = f(x) = 2x + 4** and **y = $\mathbf{f^{-1}(x)}$ =** $\frac{\mathbf{x - 4}}{\mathbf{2}}$