**Inverse Functions**

*When you find an inverse function you are just reversing what has happened. An inverse function is denoted f-1(x).*

*For example, the function f(x) = 2x has the inverse f-1(x) = x÷2*

1. Complete this table

|  |  |  |
| --- | --- | --- |
| **f(x)** | **f-1(x)** | **True or False** |
| x + 5 | x - 5 |  |
| x2 | x ÷ 2 |  |
| 2x + 7 | $$\frac{x-7}{2}$$ |  |
| (x + 4)2 | (√x) + 4 |  |

2. For any False answers to Q1 write the correct f-1(x)

3. What happens if you work out: (a) ff-1(x)? (b) f-1f(x)?

*An inverse function basically changes going from x to y, with going from y to x. This means there is an easier way to find inverse functions – just reverse what is going on. You can do this by using y instead of f(x):*

***Example: f(x) = 5x – 12***

***Step 1.*** *Replace f(x) with y y = 5x – 12*

***Step 2.*** *Rearrange to make x the subject y + 12 = 5x*

$\frac{y+12}{5}=x$

***Step 3.*** *Switch the x and y* $y=\frac{x+12}{5}$

***Step 4.*** *Replace y with f-1(x)* $f^{-1}(x)=\frac{x+12}{5}$

4. Find the inverse for each of these functions:

(a) f(x) = x + 5 (b) f(x) = 3x + 8 (c) f(x) = 5x – 3 (d) f(x) = 4(x+9)

(e) f(x) = x2 + 6 (f) f(x) = (x – 7)2 (g) f(x) = 10 – x (h) f(x) = √(5x + 11)