

function of itself

This is the same as function of a function but we use the same equation twice:

Example

$f(x) = 4(3x - 1)$, what is $ff(x)$?

As before $ff(x) = f(f(x))$

$$f(x) = 4(3x - 1) \quad \text{so} \quad f(f(x)) = 4(3(f(x)) - 1)$$

$$f(f(x)) = 4(3(4(3x - 1)) - 1) = 4(3(12x - 4) - 1)$$

$$= 4(36x - 12 - 1) = 4(36x - 13)$$

$$= 144x - 52$$

$$\boxed{ff(x) = 144x - 52}$$

Note: When you have lots of brackets like above remember:

- 1) You must have as many $)$'s as you have $($'s so if you don't you've lost or gained one.
- 2) Work outwards from the inner most brackets.