Use these two functions: $f(x) = 6x - 5$ $g(x) = 2x + 3$

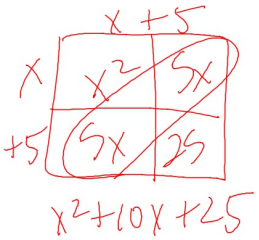
Find and simplify $f(g(x))$

$$6(2x+3) - 5$$
$$= 12x + 18 - 5$$
$$= \boxed{12x + 13}$$

Use these functions: $f(x) = x^2 + 7$ $g(x) = x + 5$ $h(x) = 2x - 9$

1. Find $f(g(x))$. Simplify as much as possible.

$$(x+5)^2 + 7$$
$$x^2 + 10x + 25 + 7 = \boxed{x^2 + 10x + 32}$$



2. Find $h(g(x))$. Simplify as much as possible.

$$2(x+5) - 9 = 2x + 10 - 9$$
$$= \boxed{2x + 1}$$

$$(5x - 13)^2 = 25x^2 - 130x + 169$$

$$(5x)(-13) \cdot 2$$

Use these functions: $f(x) = x^2 + 7$ $g(x) = x + 5$ $h(x) = 2x - 9$

Find $h(h(x))$.

$$2(2x-9) - 9$$
$$\boxed{4x - 27}$$

Use these two functions.

$$f(x) = (x+3)^2 - 1 \qquad g(x) = \sqrt{x+1} - 3$$

1. Find f(g(x)). Simplify as much as possible.

$= (\sqrt{x+1} - 3 + 3)^2 - 1 = (\sqrt{x+1})^2 - 1$

$x + 1 - 1 = x$

2. Find g(f(x)). Simplify as much as possible.

$\sqrt{(x+3)^2 - 1 + 1} - 3$

$\sqrt{(x+3)^2} - 3 = x + 3 - 3 = x$

Whenever f(g(x))=x and g(f(x))=x

the functions f(x) and g(x) are called INVERSES