Sums & Differences of functions (10.1)

Gr 8+9: $y = 3x + 2$

Gr 10, 12 $f(x) = 3x + 2$

f of x

$f(x) = 3x + 2$

input   output

$f(2) = 3(2) + 2$ input   output

$f(2) = \underline{8}$ 6   +2 $\Longrightarrow$ $(2, 8)$

$f(x) = x^2 - 3x + 5$

$f(-3) = (-3)^2 - 3(-3) + 5$

$\quad = 9 + 9 + 5 = 23$

So: if $f(x) = 3x + 7$ and $g(x) = 2x^2 - 7x$

What is $f(x) + g(x)$?

same! $(f + g)(x)$

$f(x) + g(x) = 3x + 7 + 2x^2 - 7x$

$\quad = 2x^2 - 4x + 7$

$g(x) - f(x) = 2x^2 - 7x - (3x + 7)$

$\quad = 2x^2 - 7x - 3x - 7$

$\quad = \boxed{2x^2 - 10x - 7}$

$g(3) - f(3) = 2(3)^2 - 10(3) - 7$

$\quad = 18 - 30 - 7 = -19$

If $h(x) = (f+g)(x)$ and $f(x) = 5x+2$,

find $g(x)$ for:

(i) $h(x) = \boxed{x^2} + 5x + 2$

$h(x) = f(x)\boxed{+g(x)}$

$-f(x) \quad -f(x)$

$h(x) - f(x) = g(x)$

$x^2 + 5x + 2 - (5x+2) = g(x)$

$x^2 + \cancel{5x} + \cancel{2} - \cancel{5x} - \cancel{2} = g(x)$

$x^2 = g(x)$

(ii) $h(x) = (f+g)(x)$ $f(x) = 5x+2$

$h(x) = 3x^2 + 4x - 2$ $g(x) = ?$

$h = f + \boxed{g}$

$-f \quad -f$

$h - f = g$

$3x^2 + 4x - 2 - (5x+2) = g(x)$

$3x^2 + 4x - 2 - 5x - 2 = g(x)$

$3x^2 - x - 4 = g(x)$

$y = f(x)$

$y = g(x)$

what is:

$$(f + g)(5) = 12$$

$(5, 8)$

$y = f(x)$

$(5, 4)$

$f(5) + g(5)$

2

$$4 + 8 = 12$$

-3

5

$(f - g)(-3)$

$f(-3) - g(-3)$

$$2 - 0 = 2$$