$f(x) = x^2$

$g(x) = x - 1$

Find fog and gof

$fog \rightarrow f(g(x))$

$\downarrow$

$((x-1))^2$

$\downarrow$

$(x-1)(x-1)$

$\downarrow$

$x^2 - x - x + 1$

$\downarrow$

$x^2 - 2x + 1$

$gof \rightarrow g(f(x))$

$(x^2) - 1$

$\downarrow$

$x^2 - 1$

$fog = x^2 - 2x + 1$

$gof = x^2 - 1$

$f(x) = x$

$g(x) = 2x - 1$

Find $(fg)(-1)$

$(-1)(2(-1) - 1)$

$-1(-2 - 1)$

$-1(-2 + -1)$

$-1(-3)$

3

$(f \circ h \circ g)(0)$ → $f(0)$, $h(0)$, $g(0)$ where $x = 0$

$f(0) = 2$, $h(0) = ?$, $g(0) = -3$

$f(h(g(x)))$

$f(h(g(0)))$

$f(h(-3))$

$f(3) = 9$

$(f \circ g)(-2)$

$f(g(-2))$

$f(1) = 1$

$(gh)(-1)$

$g(-1) \cdot h(-1)$

$(-1) \cdot (4)$

-4

$(f+g)(-1)$

$f(-1) + g(-1)$

$1 + -1$

0

$(f/h)(1)$

$\frac{f(1)}{h(1)} = \frac{1}{5}$

$(g-f)(2)$

$g(2) - f(2)$

$0 - 1$

-1

$f(x) = x^2$ $\qquad$ $g(x) = x - 1$

Find fog and gof

fog → f(g(x))

↓

$((x-1))^2$

↓

$(x-1)(x-1)$

↓

$x^2 - x - x + 1$

↓

$x^2 - 2x + 1$

gof → g(f(x))

$(x^2) - 1$

↓

$x^2 - 1$

$fog = x^2 - 2x + 1$

$gof = x^2 - 1$

$(f \circ h \circ g)(-5)$

$\downarrow$

$f(h(g(-5)))$

$\downarrow$

$h(-3)$

$f(4) = 1$

$(f \circ h \circ g)(-5) = 1$

$(g \circ h)(4)$

$\downarrow$

$g(h(4))$

$\downarrow$

$g(-1)$

$(g \circ h)(4) = 4$

$\left(\frac{f}{g}\right)(1)$

$\downarrow$

$\frac{f(1)}{g(1)} = \frac{-3}{6} = -\frac{1}{2}$

$(f/g)(1) = -1/2$

$(fg)(1)$

$\downarrow$

$f(1) \cdot g(1)$

$-3 \cdot 6$

$=$

-18

$(fg)(1) = -18$

$(f \cdot g)(-4)$

$\downarrow$

$f(-4) \cdot g(-4)$

$-4 \cdot -2$

$-4 + -2$

-6

$f + g$

$\downarrow$

$f(x) + g(x)$