To find the inverse of function algebraically you will switch x and y. Then, solve for y!

Example 1: $y = 8 - 3x$ Find the inverse.

① $x = 8 - 3y$

② $x = 8 - 3y$

$-8 \quad -8$

$\frac{x-8}{-3} = \frac{-3y}{-3}$

$\boxed{y^{-1} = \frac{x-8}{-3}}$

$y = 8$ is added

$-3$ is multiplied

inverse = "opposite"

$y^{-1}$ = 8 is subtracted

$-3$ is divided

Example 2 $y = \frac{x+5}{2}$ Find the inverse.

① $x = \frac{y+5}{2}$

② $2(x) = \left(\frac{y+5}{2}\right)2$

$2x = y + 5$

$-5 \quad -5$

$\boxed{2x - 5 = y^{-1}}$

$-1$ means inverse

$y = 2$ is divided

5 is added

$y^{-1}$ = 2 is multiplied

5 is subtracted

# Function Operations

$f(x) = 7y^3 - 3y^2$ $\quad g(x) = 5y^3 - 9y$

$(f+g)(x) = 7y^3 - 3y^2 + 5y^3 - 9y = 12y^3 - 3y^2 - 9y$ ✱

"f plus g of x"

$(f-g)(x) = 7y^3 - 3y^2 - (5y^3 - 9y)$

"f minus g of x"

$= 7y^3 - 3y^2 - 5y^3 + 9y$

$= 2y^3 - 3y^2 + 9y$ ✱

$(f \cdot g)(x) = (7y^3 - 3y^2)(5y^3 - 9y)$

"f times g of x"

$= 35y^6 - 63y^4 - 15y^5 + 27y^3$ ✱

✱ when you multiply like bases, you add the exponents