

## 1.7 Function

$$f(x) = 3x + 4$$

$$g(x) = 5x - 1$$

$$(f+g)(x) = (3x+4) + (5x-1)$$

$$f(x) + g(x) = 8x + 3$$

$$(f-g)(x) = (3x+4) - (5x-1)$$

$$= -2x + 5$$

$$(fg)(x) = (3x+4)(5x-1)$$

$$= 15x^2 - 3x + 20x - 4$$

$$= 15x^2 + 17x - 4$$

$$\left(\frac{f}{g}\right)(x) = \frac{3x+4}{5x-1}$$

Domain  $5x-1 \neq 0$

All Reals  
except  $\frac{1}{5}$

$$5x \neq 1$$

$$x \neq \frac{1}{5}$$

# Composite Function

$$f(x) = 3x + 4$$

$$g(x) = 5x - 1$$

$$\begin{aligned} (f \circ g)(x) &= 3(5x - 1) + 4 \\ f \cdot g &= 15x - 3 + 4 \\ &= 15x + 1 \end{aligned}$$

$$\begin{aligned} g \circ f &= 5(3x + 4) - 1 \\ &= 15x + 20 - 1 \\ &= 15x + 19 \end{aligned}$$

$$\begin{aligned} (f \circ g)(2) &= 15x + 1 \\ &= 15(2) + 1 \\ &= 30 + 1 \\ &= 31 \end{aligned}$$

$$f(x) = 3x + 4$$

$$g(x) = 5x - 1$$

$$\begin{aligned} g(2) &= 5(2) - 1 \\ &= 9 \end{aligned}$$

$$\begin{aligned} f(9) &= 3(9) + 4 \\ &= 27 + 4 \\ &= 31 \end{aligned}$$

