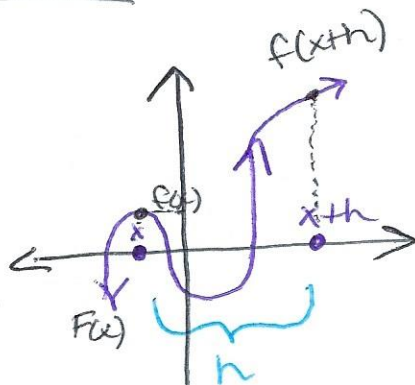


# Difference Quotient

$$(x_1, y_1) (x_2, y_2)$$

$$\text{Slope } \frac{y_2 - y_1}{x_2 - x_1}$$

$$(x, f(x)) (x+h, f(x+h))$$



$$\frac{f(x+h) - f(x)}{x+h-x} = \frac{f(x+h) - f(x)}{h}$$

**ex** Find the difference quotient.

$$f(x) = 2x + 5$$

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

$$\frac{2x + 2h + 5 - 2x - 5}{h} = \frac{2h}{h} = \boxed{2}$$

Piece-wise functions

$$f(x) = \begin{cases} 3x - 2, & x \leq -1 \\ 5, & -1 < x \leq 3 \\ \sqrt{x+2}, & x > 3 \end{cases}$$

Evaluate  $F(0)$  and  $F(7)$

$$F(0) = \boxed{5}$$

$$F(7) = \sqrt{7+2} = \sqrt{9} = \boxed{3}$$

Daisy G Pgl  
Math 2311  
Thu 2-14-19

# Add and Multiply functions

Pg 2

$$\boxed{\text{ex}} \quad f(x) = 3x - 7 \quad g(x) = 4x^2 + 6x - 5$$

$$(f+g)(x) = \underline{3x} - 7 + 4x^2 + \underline{6x} - 5$$
$$= 4x^2 + 9x - 12$$

$$(fg)(x) = (3x-7)(4x^2+6x-5)$$

$$= 12x^3 + 18x^2 - 15x - 28x^2 - 42x + 35$$

$$= 12x^3 - 10x^2 - 57x + 35$$

## Dividing functions

$$f(x) = \sqrt{x-7}$$

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

$$\frac{f}{g}(x) = \frac{\sqrt{x-7}}{x-5}$$