

# EVALUATING FUNCTIONS

$$f(x) = x^2 + 7$$

$$f(3) = (3)^2 + 7 \quad | \quad f(a) = a^2 + 7$$
$$= 9 + 7$$

$$f(3) = 16$$

$$f(3a) = (3a)^2 + 7$$

$$f(3a) = 9a^2 + 7$$

$$f(b+1) = (b+1)^2 + 7$$

$$(b+1)(b+1) + 7$$

$$b^2 + 2b + 1 + 7$$

$$f(b+1) = b^2 + 2b + 8$$

$$f(x) = 3x - 1$$

$$\underbrace{f(14)} - \underbrace{f(2)}$$

$$\underbrace{3(14) - 1} - \underbrace{(3(2) - 1)}$$

$$41 - 5$$

$$\boxed{36}$$

{ CAUTION!  
{  $f(14) - f(2)$   
{  $\neq f(12)$   
}

$$f(x) = \sin x$$

$$f\left(\frac{\pi}{4}\right) = \sin\left(\frac{\pi}{4}\right)$$

$$f\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

$$f(\pi) = \sin \pi$$

$$f(\pi) = 0$$

$$\sin \theta = y\text{-value}$$

$$\cos \theta = x\text{-value}$$

$$\tan \theta = \frac{y}{x}$$

$$\csc \theta = \frac{1}{y}$$

$$\sec \theta = \frac{1}{x}$$

$$\cot \theta = \frac{x}{y}$$

$$g(x) = \sin 4x$$

$$g\left(\frac{\pi}{2}\right) = \sin \underbrace{4\left(\frac{\pi}{2}\right)}_{2\pi}$$

$$= \sin 2\pi$$

$$\boxed{g\left(\frac{\pi}{2}\right) = 0}$$

$$f(x) = 2x + 3$$

$$f(x + \Delta x) = 2(x + \Delta x) + 3$$

$$= 2x + 2\Delta x + 3$$

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$$f(1) = 2(1) + 3$$

$$= 5$$

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$$\frac{f(x + \Delta x) - f(1)}{\Delta x}$$

$$\frac{2(x + \Delta x) + 3 - (2(1) + 3)}{\Delta x}$$

$$\frac{2x + 2\Delta x + 3 - 5}{\Delta x}$$

$$\frac{2x + 2\Delta x - 2}{\Delta x}$$

$$f(x) = x^2 + 7$$

$$\frac{f(x + \Delta x) - f(x)}{\Delta x}$$

$$\frac{(x + \Delta x)^2 + 7 - (x^2 + 7)}{\Delta x}$$

$$\frac{(x + \Delta x)(x + \Delta x) + 7 - x^2 - 7}{\Delta x}$$

$$\frac{x^2 + x\Delta x + x\Delta x + (\Delta x)^2 + 7 - x^2 - 7}{\Delta x}$$

$$\frac{2x\Delta x + (\Delta x)^2}{\Delta x}$$

$$2x + \Delta x$$