





































# Scaling and Shifting

$$f(t) = A \sin(\omega t + \phi)$$

# Scaling and Shifting

$f(t)$

# Scaling and Shifting

**f**

# Scaling and Shifting

**f**





# Scaling and Shifting

$$f(t) = A \sin(\omega t + \phi)$$





# Scaling and Shifting

$$f(t) = A$$



## Another Example









Another Example

















## Another Example





## Another Example



## Another Example











## Graph of $h$

$$h(t) = 1 + 10t - 5t^2$$









h

$$h(t) = 1 + 10t - 5t^2 = -5(\mathbf{t - 1}$$

$$h(t) = 1 + 10t - 5t^2 =$$





$$h(t) = 1 + 10t - 5t^2 = -5(t - 1)^2 + 6$$

$$h(t) = 1 + 10t - 5t^2 = -5(t - 1)^2 + 6$$

$$h(t) = 1 + \frac{135Tm}{5/R2910.9091Tf 4.2048} (t) - 1.8$$





$$h(t) = 1 + 10t - 5t^2 = -5(t - 1)^2 + 6$$























# Composition of Functions

2





# Composition of Functions

**x**

$$x \stackrel{f}{\mapsto} x-1 \stackrel{g}{\mapsto} (x-1)^2 = h(x) = (x-1)^2$$

○











## Decomposition of functions

$$h(x) = \cos^3(2x) = (\cos(2x))^3$$

**Write as a composition of simpler rules**



























# Decomposition of functions





## Decomposition of functions

$$h(x) = \cos^3(2x) = (\cos(2x))^3$$

**Write as a composition of simpler rules**

**Strategy: What operations are performed?**

**Example: To compute  $h(\pi/4)$ :**

