

## Differentiating Trig Functions

1) Find  $\frac{dy}{dx}$  for  $y = \sin(2x)$

$$\frac{dy}{dx} = \cos(2x) \cdot 2$$

$$= 2 \cdot \cos(2x)$$

2) Find  $\frac{dy}{dx}$  of  $y = \cos(x^2 - 5x)$

$$\frac{dy}{dx} = -\sin(x^2 - 5x) \cdot (2x - 5)$$

$$= -(2x - 5) \sin(x^2 - 5x)$$

$$= (5 - 2x) \sin(x^2 - 5x)$$

3) Find  $\frac{dy}{dx}$  for  $y = \sin^4(3x) \rightarrow [\sin(3x)]^4$

$$\begin{aligned}\frac{dy}{dx} &= 4 \sin^3(3x) \cos(3x) \cdot 3 \\ &= 12 \sin^3(3x) \cos(3x)\end{aligned}$$

4) Find  $\frac{dy}{dx}$  for  $y = \tan^3(x^2)$

$$\begin{aligned}\frac{dy}{dx} &= 3 \tan^2(x^2) \cdot \sec^2(x^2) \cdot 2x \\ &= 6x \tan^2(x^2) \cdot \sec^2(x^2) \dots\end{aligned}$$

5) Find  $\frac{dy}{dx}$  for  $y = x^2 \cdot \cos(3x)$

$$\begin{aligned}\frac{dy}{dx} &= 2x \cdot \cos(3x) + x^2(-\sin(3x) \cdot 3) \\ &= 2x \cos(3x) - 3x^2 \sin(3x)\end{aligned}$$

6) Find  $\frac{dy}{dx}$  for  $y = \frac{\tan(5x)}{x^3 - 4}$

$$\begin{aligned}\frac{dy}{dx} &= \frac{5 \sec^2(5x)(x^3 - 4) - 3x^2(\tan 5x)}{(x^3 - 4)^2} \\ &= \frac{5(x^3 - 4) \sec^2(5x) - 3x^2(\tan 5x)}{(x^3 - 4)^2}\end{aligned}$$

1) Find  $\frac{dy}{dx}$  for  $\sin x + \sin 2y = 1$

$$\cos x + \cos 2y \cdot 2 \frac{dy}{dx} = 0$$

$$2 \cos 2y \frac{dy}{dx} = -\cos x$$

Today pg. 140 #1-11, 19, 26

Thurs Pg. 147 #1-3 | odds  
(evens too?)

$$\frac{dy}{dx} = \frac{-\cos x}{2 \cos 2y}$$