

## Using the Chain Rule to Differentiate Trig Fcns.

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ex. 1 Differentiate

a)  $2 \sin(3\theta)$

$$\begin{aligned}\frac{d}{d\theta} (2 \sin(3\theta)) &= 2 \cos(3\theta) \cdot 3 \\ &= 6 \cos(3\theta)\end{aligned}$$

b)  $\cos^2 x$

$$\begin{aligned}\frac{d}{dx} \cos^2 x &= 2 \cos x (-\sin x) \\ &= -2 \sin x \cos x \\ &= -\sin 2x\end{aligned}$$

c)  $\cos(x^2)$

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

d)  $\sin(x^3 - 3x)$

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

e)  $\sin^3(4x)$

$$\begin{aligned}\frac{d}{dx} \sin^3(4x) &= 3 \sin^2(4x) \cdot \cos(4x) \cdot 4 \\ &= 12 \sin^2(4x) \cos(4x)\end{aligned}$$

pg. 153  
# 1-7 odd  
13-31 odd