

## Advanced Derivative Rules

### 4.3B – Products, Quotients & Trigonometry

A: Differentiate using the Product Rule

#1)  $\frac{d}{dx}(6x^3 \cos(x))$

#2) If  $f(x) = 4x^2 \sin(x)$ , find  $f'(x)$ .

#3)  $\frac{d}{dx}[x \sin(x)]$

#4) If  $f(x) = (x^2 + 1)\tan(x)$ , find  $f'(x)$ .

#5)  $\frac{d}{dx}[\sin(x) \cos(x)]$

#6) If  $f(x) = 7\tan(x)$ , find  $f'(x)$ .

#7)  $\frac{d}{dx}[\tan(x) \cot(x)]$

#8) Prove that  $\frac{d}{dx} \csc(x) = -\csc(x) \cot(x)$

# Advanced Derivative Rules

## 4.3B – Products, Quotients & Trigonometry

B: Differentiate using the Quotient Rule.

$$\#9) \frac{d}{dx} \left( \frac{\sin(x)}{7x-5} \right)$$

$$\#10) \frac{d}{dx} \left( \frac{6x^4 - 2x^5}{\cos(-x)} \right)$$

$$\#11) \frac{d}{dx} \left( \frac{x^2}{\sec(x)} \right)$$

$$\#12) \frac{d}{dx} \left( \frac{\csc(x)}{x^3-8} \right)$$

$$\#13) \frac{d}{dx} \left( \frac{\cot(x)+9}{\sqrt{x}} \right)$$

$$\#14) \frac{d}{dx} \left( \frac{\sin(x)}{\cos(x)+2} \right)$$