

## 1.6 The Product and Quotient Rule

### The Product Rule

$$\frac{d}{dx}[f(x) \cdot g(x)] =$$

**Example 1** Find the derivative of  $(3x^2 + 8x - 5)(x^2 + 1)$

**Example 2** Find  $f'(x)$  for  $f(x) = \sqrt[3]{x}(\sqrt{x} - x^2)$

**Example 3** Find the derivative of  $y = (2x + 3)(5x - 2)(4x + 1)$

**Example 4** Find the derivative for  $y = (2x + 3)^3$

**The Quotient Rule**

$$\frac{d}{dx} \left[ \frac{f(x)}{g(x)} \right] =$$

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**Example 5** Find  $\frac{d}{dx} \left[ \frac{3x-5}{2x+1} \right]$

**Example 6** Find the equation of the line tangent to the curve  $y = \frac{2x^3-3x}{x^2+2x}$  when  $x = 1$ .

**Example 7** Find  $\frac{d}{dx} \left[ \frac{(2x^2+3x)(4x-9)}{3x+5} \right]$