

## Product/Quotient Rules Exit Slip

Date \_\_\_\_\_ Period \_\_\_\_\_

**Differentiate each function with respect to  $x$ .**

1)  $y = (2x^2 + 3) \cdot -3x^4$

2)  $y = 2x^3(3x^2 + 2)$

3)  $y = 2x^3(-x^5 + 5)$

4)  $y = x^5(-4x^3 - 1)$

5)  $y = 4x^3(-x^5 - 4)$

6)  $y = (-x^2 + 1)x^5$

7)  $y = (5x^4 + 5)x^3$

8)  $y = -4x^2(-4x^2 + 1)$

$$9) y = -4x^5(x^3 - 2)$$

$$10) y = (-4x^2 - 3) \cdot -x^3$$

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Date \_\_\_\_\_ Period \_\_\_\_\_

**Differentiate each function with respect to  $x$ .**

1)  $y = (2x^2 + 3) \cdot -3x^4$

$$\begin{aligned}\frac{dy}{dx} &= (2x^2 + 3) \cdot -12x^3 - 3x^4 \cdot 4x \\ &= -36x^5 - 36x^3\end{aligned}$$

2)  $y = 2x^3(3x^2 + 2)$

$$\begin{aligned}\frac{dy}{dx} &= 2x^3 \cdot 6x + (3x^2 + 2) \cdot 6x^2 \\ &= 30x^4 + 12x^2\end{aligned}$$

3)  $y = 2x^3(-x^5 + 5)$

$$\begin{aligned}\frac{dy}{dx} &= 2x^3 \cdot -5x^4 + (-x^5 + 5) \cdot 6x^2 \\ &= -16x^7 + 30x^2\end{aligned}$$

4)  $y = x^5(-4x^3 - 1)$

$$\begin{aligned}\frac{dy}{dx} &= x^5 \cdot -12x^2 + (-4x^3 - 1) \cdot 5x^4 \\ &= -32x^7 - 5x^4\end{aligned}$$

5)  $y = 4x^3(-x^5 - 4)$

$$\begin{aligned}\frac{dy}{dx} &= 4x^3 \cdot -5x^4 + (-x^5 - 4) \cdot 12x^2 \\ &= -32x^7 - 48x^2\end{aligned}$$

6)  $y = (-x^2 + 1)x^5$

$$\begin{aligned}\frac{dy}{dx} &= (-x^2 + 1) \cdot 5x^4 + x^5 \cdot -2x \\ &= -7x^6 + 5x^4\end{aligned}$$

7)  $y = (5x^4 + 5)x^3$

$$\begin{aligned}\frac{dy}{dx} &= (5x^4 + 5) \cdot 3x^2 + x^3 \cdot 20x^3 \\ &= 35x^6 + 15x^2\end{aligned}$$

8)  $y = -4x^2(-4x^2 + 1)$

$$\begin{aligned}\frac{dy}{dx} &= -4x^2 \cdot -8x + (-4x^2 + 1) \cdot -8x \\ &= 64x^3 - 8x\end{aligned}$$

$$9) y = -4x^5(x^3 - 2)$$

$$\begin{aligned}\frac{dy}{dx} &= -4x^5 \cdot 3x^2 + (x^3 - 2) \cdot -20x^4 \\ &= -32x^7 + 40x^4\end{aligned}$$

$$10) y = (-4x^2 - 3) \cdot -x^3$$

$$\begin{aligned}\frac{dy}{dx} &= (-4x^2 - 3) \cdot -3x^2 - x^3 \cdot -8x \\ &= 20x^4 + 9x^2\end{aligned}$$