

Review for quiz 9/25/17

Use the definition of the derivative to find the derivative of each function with respect to x .

1) $y = x - 1$

2) $y = -2x + 5$

3) $y = -3x^2 - 2$

4) $y = 2x^2 + 4$

Differentiate each function with respect to x .

5) $y = \frac{5}{2}x^4 - 2x^2 + 2\sqrt[4]{x}$

6) $y = -4x^{\frac{5}{4}} + 2\sqrt[4]{x} + 2\sqrt[5]{x}$

7) $y = \frac{1}{5}\sqrt[3]{x} + \frac{2}{x^2} + \frac{1}{2}x^{-3}$

8) $y = -\frac{3}{2}x^5 + 4\sqrt[5]{x^2} + 3x^{-2}$

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

10) $y = -5x^2(4x^2 + 4)$

$$11) y = (x^5 - 5) \cdot 5x^4$$

$$12) y = -3x^2(5x^5 - 5)$$

$$13) y = \frac{5}{x^4 - 4}$$

$$14) y = \frac{5}{2x^4 + 4}$$

$$15) y = \frac{4x^3 + 4}{x^5 - 5}$$

$$16) y = \frac{5x^5 + 2x^3}{4x^3 - 2}$$

Review for quiz 9/25/17

Use the definition of the derivative to find the derivative of each function with respect to x .

1) $y = x - 1$

$$\frac{dy}{dx} = 1$$

2) $y = -2x + 5$

$$\frac{dy}{dx} = -2$$

3) $y = -3x^2 - 2$

$$\frac{dy}{dx} = -6x$$

4) $y = 2x^2 + 4$

$$\frac{dy}{dx} = 4x$$

Differentiate each function with respect to x .

5) $y = \frac{5}{2}x^4 - 2x^2 + 2\sqrt[4]{x}$

$$\frac{dy}{dx} = 10x^3 - 4x + \frac{1}{2x^{\frac{3}{4}}}$$

6) $y = -4x^{\frac{5}{4}} + 2\sqrt[4]{x} + 2\sqrt[5]{x}$

$$\frac{dy}{dx} = -5x^{\frac{1}{4}} + \frac{1}{2x^{\frac{3}{4}}} + \frac{2}{5x^{\frac{4}{5}}}$$

7) $y = \frac{1}{5}\sqrt[3]{x} + \frac{2}{x^2} + \frac{1}{2}x^{-3}$

$$\frac{dy}{dx} = \frac{1}{15x^{\frac{2}{3}}} - \frac{4}{x^3} - \frac{3}{2x^4}$$

8) $y = -\frac{3}{2}x^5 + 4\sqrt[5]{x^2} + 3x^{-2}$

$$\frac{dy}{dx} = -\frac{15x^4}{2} + \frac{8}{5x^{\frac{3}{5}}} - \frac{6}{x^3}$$

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

$$\begin{aligned} \frac{dy}{dx} &= (-4x^2 - 2) \cdot 16x^3 + 4x^4 \cdot -8x \\ &= -96x^5 - 32x^3 \end{aligned}$$

10) $y = -5x^2(4x^2 + 4)$

$$\begin{aligned} \frac{dy}{dx} &= -5x^2 \cdot 8x + (4x^2 + 4) \cdot -10x \\ &= -80x^3 - 40x \end{aligned}$$

$$11) y = (x^5 - 5) \cdot 5x^4$$

$$\begin{aligned} \frac{dy}{dx} &= (x^5 - 5) \cdot 20x^3 + 5x^4 \cdot 5x^4 \\ &= 45x^8 - 100x^3 \end{aligned}$$

$$12) y = -3x^2(5x^5 - 5)$$

$$\begin{aligned} \frac{dy}{dx} &= -3x^2 \cdot 25x^4 + (5x^5 - 5) \cdot -6x \\ &= -105x^6 + 30x \end{aligned}$$

$$13) y = \frac{5}{x^4 - 4}$$

$$\begin{aligned} \frac{dy}{dx} &= -\frac{5 \cdot 4x^3}{(x^4 - 4)^2} \\ &= -\frac{20x^3}{x^8 - 8x^4 + 16} \end{aligned}$$

$$14) y = \frac{5}{2x^4 + 4}$$

$$\begin{aligned} \frac{dy}{dx} &= -\frac{5 \cdot 8x^3}{(2x^4 + 4)^2} \\ &= -\frac{10x^3}{x^8 + 4x^4 + 4} \end{aligned}$$

$$15) y = \frac{4x^3 + 4}{x^5 - 5}$$

$$\begin{aligned} \frac{dy}{dx} &= \frac{(x^5 - 5) \cdot 12x^2 - (4x^3 + 4) \cdot 5x^4}{(x^5 - 5)^2} \\ &= \frac{-8x^7 - 20x^4 - 60x^2}{x^{10} - 10x^5 + 25} \end{aligned}$$

$$16) y = \frac{5x^5 + 2x^3}{4x^3 - 2}$$

$$\begin{aligned} \frac{dy}{dx} &= \frac{(4x^3 - 2)(25x^4 + 6x^2) - (5x^5 + 2x^3) \cdot 12x^2}{(4x^3 - 2)^2} \\ &= \frac{20x^7 - 25x^4 - 6x^2}{8x^6 - 8x^3 + 2} \end{aligned}$$