

Higher Order Derivatives Practice

Date _____ Period _____

For each problem, find the indicated derivative with respect to x .

1) $y = 3x^2$ Find $\frac{d^2y}{dx^2}$

2) $y = 3x$ Find $\frac{d^2y}{dx^2}$

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

4) $y = -x^4 + 5x$ Find $\frac{d^4y}{dx^4}$

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

6) $y = -2x^5 - 4x^4 + 2x^3$ Find $\frac{d^3y}{dx^3}$

7) $y = -9x^{-2}$ Find $\frac{d^2y}{dx^2}$

8) $y = -2x^{\frac{5}{4}}$ Find $\frac{d^3y}{dx^3}$

9) $y = 6x^{\frac{1}{6}}$ Find $\frac{d^4y}{dx^4}$

10) $y = -4x^{\frac{5}{3}} + 2\sqrt[4]{x^3} + 2x^{\frac{2}{3}}$ Find $\frac{d^2y}{dx^2}$

11) $y = -\sqrt[4]{x^3} - 9x^{-4} + \frac{6}{x^6}$ Find $\frac{d^2y}{dx^2}$

Answers to Higher Order Derivatives Practice (ID: 1)

$$\begin{array}{llll} 1) \frac{d^2y}{dx^2} = 6 & 2) \frac{d^2y}{dx^2} = 0 & 3) \frac{d^2y}{dx^2} = -80x^3 + 24x & 4) \frac{d^4y}{dx^4} = -24 \\ 5) \frac{d^2y}{dx^2} = 48x^2 + 6x & 6) \frac{d^3y}{dx^3} = -120x^2 - 96x + 12 & 7) \frac{d^2y}{dx^2} = -\frac{54}{x^4} & \\ 8) \frac{d^3y}{dx^3} = \frac{15}{32x^{\frac{7}{4}}} & 9) \frac{d^4y}{dx^4} = -\frac{935}{216x^{\frac{23}{6}}} & 10) \frac{d^2y}{dx^2} = -\frac{40}{9x^{\frac{1}{3}}} - \frac{3}{8x^{\frac{5}{4}}} - \frac{4}{9x^{\frac{4}{3}}} & \\ 11) \frac{d^2y}{dx^2} = \frac{3}{16x^{\frac{5}{4}}} - \frac{180}{x^6} + \frac{252}{x^8} & & & \end{array}$$