Math 220 - Calculus f. Business and Management - Worksheet 17

Worksheet 17 - Leibniz Notation and Higher Order Derivatives

Find the second derivative of each function

Exercise 1: *Note that you previously computed the first dervatives (worksheet 14).*

$$\textbf{1a}: f(x) = x^3 + 2x - 5, \qquad \textbf{1b}: f(x) = 6x^4 - 3x^2 + 2x - 7, \qquad \textbf{1c}: f(x) = \sqrt[4]{x}, \qquad \textbf{1d}: f(x) = \frac{1}{x^3}.$$

Exercise 2: *Note that you previously computed the first dervatives (worksheet 14).*

$$\textbf{2a}: f(x) = \sqrt{x^5}, \qquad \textbf{2b}: f(x) = \frac{7}{\sqrt{x}}, \qquad \textbf{2c}: f(x) = \sqrt[3]{\frac{5}{x^2}}.$$

Exercise 3: *Note that you previously computed the first dervatives for the first two functions (worksheet 15).*

$$\textbf{3a}: f(x) = e^x x^2, \qquad \textbf{3b}: f(x) = \frac{\sqrt{x}}{5e^x}. \qquad \textbf{3c}: f(x) = \ln(3x^2 + 2x - 5).$$

Motion problem

Exercise 4: *An object is sliding on a rail in such a way that its position can be described by this equation:*

$s(t) = t^3 - 9t^2 + 20t \, m$ *(meters)*

4a : *Where will the object be after 2 seconds? How fast will it be moving? What will its acceleration be?*

4b : *When will it be at the origin (position $= 0$)?*

4c : *When will its velocity be $5m/s$ (meters/second)?*

4d : *When will its acceleration be $3 \, m/s^2$ (meters/second^2)?*