

Homework Assignment for Week 09

1. Section 14.6: Problems 1, 9, 13, 19, 25, 33, 39, 45, 59, 63, 66, 67.
2. Section 14.7: Problems 1, 19, 43, 44, 49, 51, 55.
3. Section 14.9: Problems 7, 9, 11.
4. Taylor's formula for functions of 2 variables can be summarized as

$$\begin{aligned} f(x_0 + \Delta x, y_0 + \Delta y) &= f(x_0, y_0) + \sum_{k=1}^n \frac{1}{k!} \left(\Delta x \partial_x + \Delta y \partial_y \right)^k f(x_0, y_0) \\ &\quad + \frac{1}{(n+1)!} \left(\Delta x \partial_x + \Delta y \partial_y \right)^{n+1} f(x_0 + c\Delta x, y_0 + c\Delta y), \quad 0 < c < 1. \end{aligned}$$

Derive a similar formula for functions of 3 variables.