

Homework 7

Math 147, Fall 2023

This homework is due on Friday, Oct. 6 (at the start of recitation). *Turn in (via Gradescope) your answers to questions 1–5.*

0. Read Sections 4.4 and 4.5.
1. Which of the following functions can you differentiate using the Power Rule: x^x , 5^x , x^5 , e^x , x^e ? Explain your answer.
2. Compute the derivative of $x^{100}(x - 1)^{10}(1 - x)^{10}$.
3. An ant is walking around the unit circle. Let $\theta(t)$ denote the angle of the ant at time t . Let $(x(t), y(t))$ denote the position of the ant at time t .
 - (a) State an expression for $x'(t)$ in terms of $\theta(t)$.
 - (b) State an expression for the second derivative $y''(t)$ in terms of $\theta(t)$.
4. Section 4.4 # 14, 36, 46, 52, 58, 64, 70, 86
5. Section 4.5 # 28, 30, 38, 42
6. (These problems are *not* to be turned in!)
 - (a) Section 4.4 # 5, 9, 21, 33, 35, 41, 45, 47, 51, 55, 61, 69, 77, 85, 87
 - (b) Section 4.5 # 5, 9, 23, 27, 29, 39, 43