

Math 114 Spring 2019  
Calculus I HW 6  
Due Wednesday, March 20

For this homework you may compute derivatives using any tools we have developed in class.

1. Stewart 3.4.6 (ab)
2. Stewart 3.4.8
3. Stewart 3.4.14
4. Suppose we know that  $f''(t) = -f(t)$ , and we know that  $f(0) = -1$  and  $f(\pi/3) = 4$ . Find a formula for  $f(t)$ .
5. Suppose  $f'(x) = \frac{1}{2}f(x)$  and  $f(1) = 3$ . Use Euler's method to approximate  $f(4)$  using three steps.
6. Suppose  $f'(x) = 4 - \frac{f(x)}{x}$ , and  $f(2) = 2$ . Use Euler's method and four steps to approximate  $f(4)$ .
7. Suppose  $f'(x) = xf(x)$ , and  $f(0) = 3$ . Use four steps to estimate  $f(4)$ .
8. Suppose we have the differential equation  $y'' = 3y$ , and  $y(0) = 2, y'(0) = -1$ . Use three steps of Euler's method to estimate  $y(3)$ .
9. Stewart 3.4.18(a)
10. Stewart 3.3.28
11. Stewart 3.3.32
12. Stewart 3.3.46
13. Stewart 2.6.10
14. Stewart 2.6.20
15. Stewart 2.6.22
16. Suppose we know that  $x^2 + y^2 = (2x^2 + 2y^2 - x)^2$ , and we know that  $y(0) = 1/2$ . Estimate  $y(.1)$  using a linear approximation.