

Math 114 Spring 2019
Calculus I HW 7 Solutions
Due Wednesday, April 3

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

1. Stewart 3.2.6
2. Stewart 3.2.8
3. (★) Stewart 3.2.16
4. (★) Stewart 3.2.24
5. Stewart 3.2.30
6. Stewart 3.2.32
7. Stewart 3.2.36
8. Stewart 3.2.38
9. (★) Stewart 1.5.36 (Note about notation: what they call N is the target value that I called y .)
10. Stewart 1.5.40
11. Stewart 1.5.42
12. Use the Intermediate Value Theorem to show that the function $f(x) = x^6 + 5x - 5$ has at least two distinct roots.

Solution: Because f is a polynomial, it is continuous everywhere.

We compute that $f(0) = -5$ and $f(1) = 1$. Since $-5 < 0 < 1$ and f is continuous on $[0, 1]$, by the Intermediate Value Theorem we know that f has a root between 0 and 1.

We compute that $f(-1) = -9$ and $f(-2) = 49$. Since $-9 < 0 < 49$ and f is continuous on $[-2, -1]$, by the intermediate value theorem we know that f has a root between -2 and -1 .

Thus f has (at least) two distinct real roots.