A1: Newton

Amy Creel
MATH 361B

April 10, 2019

The first equation to approximate solutions to is:

$$f(x) = \frac{1}{100}\left[x^4 + (e - 2 - \sqrt{2})x^3 + (2\sqrt{2} - \sqrt{2}e - 3 - 2e)x^2 + (2\sqrt{2}e + 3\sqrt{2} - 3e)x + 3\sqrt{2}e\right] = 0$$

The derivative of this equation is:

$$f'(x) = \frac{1}{100}\left[4x^3 + 3(e - 2 - \sqrt{2})x^2 + 2(2\sqrt{2} - \sqrt{2}e - 3 - 2e)x + (2\sqrt{2}e + 3\sqrt{2} - 3e)\right]$$

The solutions to this equation are:

Initial Guess	Number of Iterations	Approximate Solution
1.4	two	1.41421356
0.5	nine	3
-0.5	four	-1
-5	seven	-2.71828183

The second equation to approximate solutions to is:

$$f(x) = tan(x) - x - 2 = 0$$

The derivative of this equation is:

$$f'(x) = sec^2(x) - 1 = 0$$

Two negative and two positive solutions to this equation are:

Initial Guess	Number of Iterations	Approximate Solution
-7.6	five	-7.67970225
-4.2	four	-4.30268867
1.5	six	1.27439268
4.7	eight	4.56114043