ME EN 2450
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HW2

2a)

x**3 - 13*x - 12
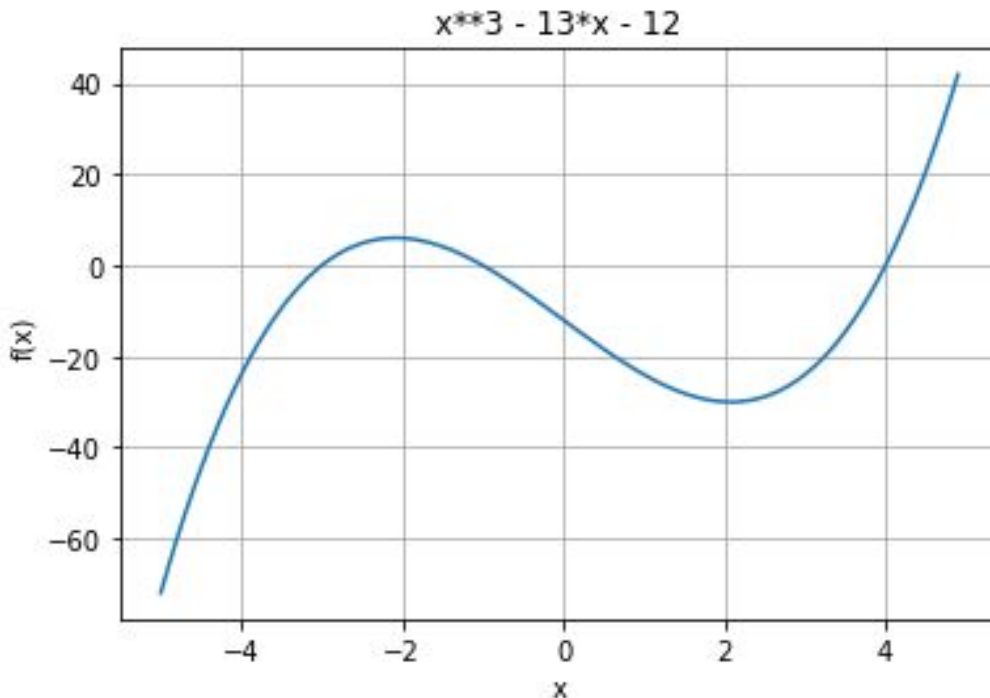
b)

Iteration	Root estimate	Approximate Relative Error(%)
1	4.5	
2	3.25	-38.46153846153847
3	3.875	16.129032258064516
4	4.1875	7.462686567164178
5	4.03125	-3.875968992248062

c) Comparing Müller's method to the bisection method that I created I can see that Müller's method converges to a value quicker than the bisection method. This can be seen as after 5 iterations the approximate relative error of Müller's method is .0000119% while the bisection method is 3.876%. Since the error of Müller's method is less after the same iterations we can see convergence is quicker and thus for this problem Müller's method converges quicker than the bisection method.

3b) Newton Raphson, root = 80.49844718999243inches iterations = 3 tolerence = 0.001% initial guess = 90inches

c)Scipy fsolve, root = 80.49844718999243inches

As we can see the Newton Raphson method gives the same answer as Scipy fsolve, both are: 80.49844718999243 inches.

d)Max displacement = -2.985433897788816inches
This number seems reasonable because for a 15 foot beam we see that we have approximate a maximum of 3 inches of deflection. This is not too large(depends on application though) since we likely want some compliance in our beam.