Rashik Rahman
1720101 2

1. Ans:

$$f(x) = x^2 + 2x - 4$$

$$f'(x) = 2x + 2$$

Newton Raphson method,

$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$$

Iteration 1,

for, $x_0 = 4$

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0}$$

$$= 4 - \frac{f(4)}{f'(4)}$$

$$= 4 - \frac{20}{10}$$

$$= 4 - 2$$

$$= 2$$

Iteration 2:

for, $x_1 = 2$

$$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)}$$

$$= 2 - \frac{f(2)}{f'(2)}$$

$$= 2 - \frac{4}{6}$$

$$= 2 - \frac{2}{3}$$

$$= \frac{6-2}{3}$$

$$= \frac{4}{3}$$

$$= 1.3333$$

∴ The second iterative value is 1.3333.

2. Ans:

Drawbacks of bisection method are given below:

*) Slow convergence: As the bisection method convergo ~~fo~~rom two ends ~~if~~ so if one of the end or both of the are near the root initially ~~the~~ then it would take a lot of time to converge to the root.

*) function dependency: ~~In bisect~~ To implement bisection method ~~@~~ $f(x_l) * f(x_u) < 0$ this rule must be satisfied. But let assume for a function $f(x) = x^2$ this function won't satisfy the rule. ~~@~~ So bisection is dependent of what type of function it is.

*) root existance confusion:

If a function changes sign frequently the bisection method won't be able to find a root cause there may not a be a single root or can be multiple roots.