Konkuk University Dept. Of Physics

# Numerical Analysis

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## 1 Root Finding Methods

### 1.1 Bisection Method

look at this code

Listing 1: test.m

```
%clear all

f=inline('exp(-x.^2)*2/sqrt(pi)');
true=[erf(1) erf(1) erf(1)];

n=1000;
x=linspace(0,1,n+1);

sum=[0 0 0];
for k=1:n
        a=x(k); b=x(k+1); m=(a+b)/2;
        sum(1)=sum(1)+(b-a)*(f(a)+f(b))/2; %trapezoidal rule
        sum(2)=sum(2)+(b-a)*f(m); %midpoint rule
        sum(3)=sum(3)+(b-a)*(f(a)+4*f(m)+f(b))/6; %Simpson rule
end

err=abs(sum-true)
```

```
18 err_r=[1 err(2)/err(1) err(3)/err(1)]
```

yes this is a code

### 1.2 Newton Method

### 1.3 Secant Method

## 2 The Floating Number System

## 3 Polynomials

### 3.1 Polynomial Interpolation

### 3.2 Integration Methods