In the second formula the number is written as x = +

Example write the following numbers in the floating point formula and three decimal places

x = 63249 = 0.63249 = 0.632 + 0.49

Y = - 1579.26 = - 0.157926 = - 0.157 +(- 0.926)

z = 0.01295 = 0.1295 = 0.129 + 0.5

k = 173.18 = 0.17318 = 0.173 + 0.18

Finding the absolute and relative errors

1) Errors in chopping case

Let x = + , =

(x) = = = =

(x) = =

(x) =

(x) = =

2) Errors in chopping case

Let x = + , =

+

(x) = = = =

(x) = = =

(x) = = = = = 0.5

(x) = = =

Fundamental theorem of algebra

Every polynomial of degree n has n roots in complex numbers

Let f be a continuous function on [a , b]

If f(a) f(b) 0 then there exists roots in [a , b]

If f(a) f(b) 0 then there is no roots in [a , b]

Example Find the position of roots of f(x) = - 7+3+26x-10 in [-8,8]

x	-8	-6	-4	-2	0	2	4	6	8
F(x)	+	+	+	+	-	+	-	+	+

f(-2) f(0) 0 then there exists roots in [-2 , 0]

f(0) f(2) 0 then there exists roots in [0 , 2] f(2) f(4) 0 then there exists roots in [2 , 4]

f(4) f(6) 0 then there exists roots in [4 , 6]

1) Bisection methods

Example Find the root of x = in [0,1]

F(x) = x -

F(0) = -1 , f(1) = 0.632

f(0) f(1) 0 then there exists roots in [0 , 1]

= (0+1)/2 = 0.5 , f(0.5) = -0.1065

f(0) f(0.5) 0 then there is no roots in [0 , 0.5]

f(0.5) f(1) 0 then there exists roots in [0.5 , 1]

= (0.5+1)/2 = 0.75 , f(0.75) = 0.2776

f(0.75) f(1) 0 then there is no roots in [0.75 , 1]

f(0.5) f(0.75) 0 then there exists roots in [0.5 , 0.75]

= (0.5+0.75)/2 = 0.625 , f(0.625) = 0.0897

f(0.625) f(0.75) 0 then there is no roots in [0.625 , 0.75]

f(0.5) f(0.625) 0 then there exists roots in [0.5 , 0.625