1:
The convergence of which of the following method is sensitive to starting value?

A. False position

B. Gauss seidal method

C. Newton-Raphson method

D. All of these

Answer Report Discuss
Option: C

Explanation :

Click on Discuss to view users comments.

2:
Newton-Raphson method is used to find the root of the equation x2 - 2 = 0.
If iterations are started from - 1, then iterations will be

A. converge to -1

B. converge to √2

C. converge to -√2

D. no coverage

Answer Report Discuss
Option: C

Explanation :

Click on Discuss to view users comments.

3:
Which of the following statements applies to the bisection method used for finding roots of functions?

A. Converges within a few iterations

B. Guaranteed to work for all continuous functions

C. Is faster than the Newton-Raphson method

D. Requires that there be no error in determining the sign of the function

Answer Report Discuss
Option: B

Explanation :

Click on Discuss to view users comments.

4:
We wish to solve x2 - 2 = 0 by Newton Raphson technique. If initial guess is x_0 = 1.0, subsequent estimate of x (i.e. x_1) will be

A. 1.414

B. 1.5

C. 2.0

D. None of these

Answer Report Discuss
Option: B

Explanation :

Click on Discuss to view users comments.

5:
Using Newton-Raphson method, find a root correct to three decimal places of the equation x3 - 3x - 5 = 0

A. 2.275

B. 2.279

C. 2.222

D. None of these

Answer Report Discuss
Option: B

Explanation :

Click on Discuss to view users comments.

In the Gauss elimination method for solving a system of linear algebraic equations,triangularzation leads to

A. Diagonal matrix

B. Lower triangular matrix

C. Upper triangular matrix

D. Singular matrix

Answer Report Discuss

Option: C

Explanation :

Click on Discuss to view users comments.

7:

If Δf(x) = f(x+h) - f(x), then a constant k, Δk equals

A. 1

B. 0

C. f(k)- f(0)

D. f(x + k) - f(x)

Answer Report Discuss

Option: B

Explanation :

Click on Discuss to view users comments.

8:

Double (Repeated) root of
4x3- 8x2- 3x + 9 = 0 by Newton-raphson method is

A. 1.4

B. 1.5

C. 1.6

D. 1.55

Answer Report Discuss

Option: B

Explanation :

Click on Discuss to view users comments.

9:

Using Bisection method, negative root of x3 - 4x + 9 = 0 correct to three decimal places is

A. -2.506

B.-2.706

C.- 2.406

D.None of these

Answer Report Discuss

Option: B

Explanation :

Click on Discuss to view users comments.

10:

Four arbitrary points (x_1, y_1), (x_2, y_2), (x_3, y_3),(x_4, y_4) are given in the x, y-plane. Using the method of least squares, if regressing y upon x gives the fitted line y = ax + b; and regressing y upon x gives the fitted line y + ax + b; and regressing x upon y gives the fitted line x = cy + d, then

A.Two fitted lines must coincide

B.Two fitted lines need not coincide

C.It is possible that ac = 0

D.A must be 1/c

Answer Report Discuss

Option: D

11:

The root of x3 - 2x - 5 = 0 correct to three decimal places by using Newton-Raphson method is

A.2.0946

B.1.0404

C.1.7321

D.0.7011

Answer Report Discuss

Option: A

Explanation :

Click on Discuss to view users comments.

12:

Newton-Raphson method of solution of numerical equation is not preferred when

A. Graph of A(B) is vertical

B. Graph of x(y) is not parallel

C. The graph of f(x) is nearly horizontal-where it crosses the x-axis.

D. None of these

Answer Report Discuss

Option: C

Explanation :

Click on Discuss to view users comments.

13:

Following are the values of a function y(x) : y(-1) = 5, y(0), y(1) = 8

dy/dx at x = 0 as per Newton's central difference scheme is

A. 0

B. 1.5

C. 2.0

D. 3.0

Answer Report Discuss

Option: B

Explanation :

Click on Discuss to view users comments.

14:

A root of the equation x3 - x - 11 = 0 correct to four decimals using bisection method is

A. 2.3737

B. 2.3838

C. 2.3736

D. None of these

Answer Report Discuss

Option: C

Explanation :

Click on Discuss to view users comments.

15:
Newton-Raphson method is applicable to the solution of

A. Both algebraic and transcendental Equations

B. Both algebraic and transcendental and also used when the roots are complex

C. Algebraic equations only

D. Transcendental equations only

Answer Report Discuss
Option: A

16:
The order of error s the Simpson's rule for numercal integration with a step size h is

A. h

B. h^2

C. h^3

D. h^4

Answer Report Discuss
Option: B

Explanation :

Click on Discuss to view users comments.

17:
In which of the following methods proper choice of initial value is very important?

A. Bisection method

B. False position

C. Newton-Raphson

D. Bairsto method

Answer Report Discuss
Option: C

Explanation :

Click on Discuss to view users comments.

18:
Using Newton-Raphson method, find a root correct to three decimal places of the equation sin x = 1 - x

A. 0.511

B. 0.500

C. 0.555

D. None of these

Answer Report Discuss

Option: A

Explanation :

Click on Discuss to view users comments.

19:
Errors may occur in performing numerical computation on the computer due to

A. Rounding errors

B. Power fluctuation

C. Operator fatigue

D. All of these

Answer Report Discuss

Option: A

Explanation :

Click on Discuss to view users comments.

20:
Match the following:

A. Newton-Raphson	**1. Integration**
B. Runge-kutta	**2. Root finding**
C. Gauss-seidel	**3. Ordinary Diferential Equations**
D. Simpson's Rule	**4. Solution of system of Linear Equations**

Codes:
ABCD

A. 2341

B.3214

C.1423

D.None of these

Answer Report Discuss

Option: A

This set of Numerical Analysis Multiple Choice Questions & Answers focuses on "Newton Raphson Method – 2".

1. The value of y'/x' in terms of the angle 0 is given by _____
a) tanθ
b) secθ
c) cotθ
d) cosecθ

View Answer

Answer: a
Explanation: The value of derivative of a function f(x) is given as f'(x)=y'/x'. In terms of theta tangent is the ration of opposite side to adjacent side hence y'/x'=tanθ.

. The Newton Raphson method is also called as _____
a) Tangent method
b) Secant method
c) Chord method
d) Diameter method

View Answer

Answer: a
Explanation: Newton Raphson method is also known as Tangent Method. It is carried out by drawing a tangent to the curve at the point of initial guess

3. The equation f(x) is given as x^2-4=0. Considering the initial approximation at x=6 then the value of x_1 is given as _____
a) 10/3
b) 4/3
c) 7/3
d) 13/3

View Answer

Answer: a
Explanation: Iterative formula for Newton Raphson method is given by

$x(1)=x(0)+f(x(0))f'x(x(0))$.
Hence $x_0=6$ (initial guess), $f(x_0)=32$ and $f'(x_0)=12$.
Substituting the values in the equation we get $x_1= 10/3$.

4. For decreasing the number of iterations in Newton Raphson method:
a) The value of f'(x) must be increased
b) The value of f''(x) must be decreased
c) The value of f'(x) must be decreased
d) The value of f''(x) must be increased
View Answer

Answer: a
Explanation: Iterative formula is given by
$x(1)=x(0)+f(x(0))f'x(x(0))$.
Hence if f'(x) decreases the value of next iteration approaches the initial one. This decreases the number of iterations in finding out next iterative value

5. In Newton Raphson method f'(x) for a given point is given by the formula _____
a) y/x'
b) y'/x
c) y/x
d) y'/x'
View Answer

Answer: d
Explanation: The derivative of a function f(x) is given as f'(x) = y'/x'. It is defined as the slope of the tangent drawn at the point of assumed initial value to the curve.

6. If $f(x) = x^2-117 = 0$ then the iterative formula for Newton Raphson Method is given by _____
a) $x(n+1)=0.25$ $[x(n)+166x(n)$]
b) $x(n+1)=0.5$ $[x(n)+166x(n)$]
c) $x(n+1)=0.5$ $[x(n)-166x(n)$]
d) $x(n+1)=0.25$ $[x(n)-166x(n)$]
View Answer
Answer: b
Explanation: Consider $x(n+1)=0.5$ $[x(n)+Nx(n)$]
Where N=117. Hence $x(n+1)=0.5$ $[x(n)+117$
7. The points where the Newton Raphson method fails are called?
a) floating
b) continuous
c) non-stationary
d) stationary

Answer: d
Explanation: The points where the function f(x) approaches infinity are called as Stationary points. At stationary points Newton Raphson fails and hence it remains undefined for Stationary points

8. The convergence of which of the following method depends on initial assumed value?
a) False position
b) Gauss Seidel method
c) Newton Raphson method
d) Euler method
View Answer

Answer: c
Explanation: The Newton Raphson method the approximation value is found out by : $x(1)=x(0)+\frac{f(x(0))}{f'x(x(0))}$. Hence it depends on the initial value x_0.

9. The equation f(x) is given as $x^3+4x+1=0$. Considering the initial approximation at x=1 then the value of x_1 is given as _____
a) 1.67
b) 1.87
c) 1.86
d) 1.85
View Answer

Answer: c
Explanation: Iterative formula for Newton Raphson method is given by $x(1)=x(0)+\frac{f(x(0))}{f'x(x(0))}$
Hence $x_0=1$ (initial guess), $f(x_0)=6$ and $f'(x_0)=7$. Substituting the values in the equation we get $x_1=1.857$ which is 1.86 rounded to 2 decimal places.

1. For a determinant containing 4 elements a_1 b_1 a_2 b_2, what will the elements of the leading diagonal?
a) a_1 b_1
b) a_1 b_2
c) a_2 b_1
d) a_2 b_2
View Answer

Answer: b
Explanation: The diagonal having its first element in the top left corner of the matrix is considered as the leading diagonal of the determinant. And here, it starts from a_1 and ends at b_2.

A determinant vanishes if one of the entire row or column consists of all zero elements?
a) True
b) False
View Answer

Answer: b
Explanation: A determinant vanishes when two of the rows or columns have zero elements. It even vanishes when the elements of two rows or columns have identical elements.
True fal
True percent relative error is a measure of precision.
False
An nth order polynomial has n real or complex roots.
True
The truncation error for a 3rd order Taylor series is O(h^4).
True
Polynomial deflation is the process of removing roots from transcendental functions.
False
In general, using more bits to store a number will reduce round-off error.
True
A computers finite storage space is a source of truncation errors.
False (round-off error)
If a numerical method provides an approximate with error O(h), where h is the step size, doubling the step size will halve the error.
False
Precision refers to how closely approximations agree with each other.
True
The machine epsilon describes the worst-case scenario truncation error.
False
The interval between numbers that can be represented with fixed-point-notation increases as magnitude increases.
False
The round-off error caused by storing numbers with floating point representation is not consistent and varies greatly with the magnitude of the number being stored.
False
If a numerical method provides an approximate error O(h^2), where h is the step size, doubling the step size will quarter the error.
False
The error resulting from a Taylor series approximation will decrease as the step size h decreases.
True
The False Position Method takes into account the magnitude of the function at the guesses (Xi and Xu).
True
When open methods converge, they do so faster than bracket methods.
True

It is ok to use the approximate percent relative error for numerical methods because the approximate percent relative error will always be less than the true percent relative error.
False
If the magnitude of the condition number is larger than 1 (>>1), the system is considered well-conditioned.
False
True percent relative error is a measure of accuracy.
True
Storing only a few digits of pi is a source of truncation error.
False
The floating point storage scheme allows computers to store most numbers exactly.
False
Open methods for finding roots are slow but reliable when compared to bracket methods.
False
The standard error of the estimate describes the spread of the data around the mean value.
False
A unique nth order polynomial fit requires n-1 data points.
False
A regression line has merit if the standard error of the estimate is smaller than the standard deviation.
True
If the regression line passes directly through all data points, then the coefficient of determination will be equal to one.
True

Consider a linear system of equations in Matrix Form (Ax=B).
The solution is: x=BA^-1, where A^-1 is the inverse of the A matrix.
False
Consider a linear system of equations in Matrix Form (Ax=B).
The linear system is considered well conditioned if the determinant of A equals zero.
False
Consider a linear system of equations in Matrix Form (Ax=B).
The Gauss-Seidel method will always converge on the solution, (assuming one exist)
False
Consider a linear system of equations in Matrix Form (Ax=B).
It is more efficient to use LU decomposition to solve for A^-1 than Gauss elimination.
True
Gauss-Jordan elimination is a more efficient variation of Gauss elimination.
False
If a matrix is multiplied by its inverse, the result will be the identity matrix.
True
If AY=I, where I is the identity matrix, Y must equal A^-1.
True

The norm of a matrix is a measure of its length.
True