\* Bisection = a+b/2; \* Stopping Criteria = b-a/2n <= tolerance ==> n>= -log(e)/log(2);

Matlab Cheat Sheet:

\* RegulaFalsi / Secant = Xn+1 = (Xn-1\*f(Xn) – Xn\*f(Xn-1)) / (f(Xn) – f(Xn-1));

\* Fixed Point = X1= f(X0) \* Newton-Rapmson = Xn+1 = Xn- (f(Xn) / df’(Xn));

\* Newton-Multi-roots = Xn+1 = Xn- ( ( f(Xn)\*df’(Xn)) / ([df’(Xn)]2) – f(Xn)\*df’’(Xn) );

\* Modified-Secant-Roots = Xn+1 =Xn – ( ((Xn-Xn-1)\*(f(Xn)\*df’(Xn-1))) / ((df’(Xn-1)\*f(Xn)) - (f(Xn-1)\*df’(Xn))) );

\* Lagrange’s Linear = g(x) = ( (x-x1)/(x0-x1)\*f0 ) + ( (x-x0)/(x1-x0)\*f1 );

\* Lagrange’s Quadratic = g(x) = (((x-x1)\*(x-x2) / (x0-x1)\*(x0-x2))\*f0 + (((x-x0)\*(x-x2) / (x1-x0)\*(x1-x2))\*f1) + (((x-x0)\*(x-x1) / (x2-x0)\*(x2-x1))\*f2);

\* Lagrange’s Cubic = g(x) = (((x-x1)\*(x-x2)\*(x-x3) / (x0-x1)\*(x0-x2)\*(x0-x3))\*f0) + (((x-x0)\*(x-x2)\*(x-x3) / (x1-x0)\*(x1-x2)\*(x1-x3))\*f1) + (((x-x0)\*(x-x1)\*(x-x2) / (x2-x0)\*(x2-x1)\*(x2-x3))\*f2) + (((x-x0)\*(x-x1)\*(x-x2) / (x3-x0)\*(x3-x1)\*(x3-x2))\*f3);

\* Newton-Divided-Diff = g(x) = f0 + (x-x0)\*f[x0,x1] + (x-x0)\*(x-x1)\*f[x0,x1,x2 ]; (//depend on no. of sets.). \* Least-square-st-line = a = (Σy\*Σx2 – Σxy\*Σx) / (n\*Σx2)-( Σx)2), b = (n\*Σxy-ΣyΣx) / (n\*Σx2-(Σx)2 );

\* Trapezoidal = h/2 \*[(y­0+y1) + 2(y1+y2+y3+…+yn-1)];

\* Simpson 1/3 = h/3 \*[(y­0+y1) + 4O +2E]; O=odd index , E=even index. i=index.

\* Simpson 3/8 = 3h/8 \*[(y­0+y1) + 3N +2M]; N=not multiple of 3i, M=multiple of 3i.

\* Euler = y1 = y0+h\*f(x0,y0), x1 = x0 + h; \*Improved-euler = k1 = h \* f(x0, y0),

k2 = h \* f(x0 + h, y0 + k1), y1 = y0 + (1/2) \* (k1 + k2), x1 = x0 + h;

\* RK-4 = k1 = f(x0, y0), k2 = f(x0 + (h / 2),y0 + (k1 / 2)), k3 = f(x0 + (h / 2), y0 + (k2 / 2)), k4 = f(x0 + h, y0 + k3), y1 = y0 + ((h / 6) \* (k1 + 2 \* k2 + 2 \* k3 + k4)), x1 = x0 + h; \* Newton-forward = f(i,j) = f(i,j-1) - f(i-1,j-1);

\* Newton-backward = b(i,j) = b(i+1,j-1) - b(i,j-1); \*Jacobi / Gauss-seidel = x1=(1/a(1,1))\*(b(1)-(a(1,2)\*y)-(a(1,3)\*z)), x2=(1/a(2,2))\*(b(2)-(a(2,1)\*x)-(a(2,3)\*z)), x3=(1/a(3,3))\*(b(3)-(a(3,1)\*x)-(a(3,2)\*y)), i=((abs(x-x1)<=tol) && (abs(y-x2)<=tol) && (abs(z-x3)<=tol)); \*Modified\_Secant = a = (x0 - x1) \* f(x0) \*

(df(x1)), b = (df(x1) \* f(x0)) - (f(x1) \* df(x0)), x = x0 - (a / b); \*Newton\_multi\_roots = x1 = x0 - (f(x0)\*df(x0)) / (((df(x0))^2 - f(x0)\*dff(x0))), i=(((df(x0))^2 - f(x0)\*dff(x0)))0