%AUTHOR: DANIEL CRISP

%DESC: FINAL TEST

%filename: final.m

%% Question 1

% Write a program to animate and trace the function:

y = -2t + 1.5 for t=[-10, 10];

n = 100;

%t = -10:n:10;

t = linspace(-10, 10, n);

y = -2\*t(1:n) + 1.5;

axis([-10 10 -25 25]);

for it = 1:n

plot(t(1:it), y(1:it));

axis([-10 10 -25 25]);

title('Question 1a')

drawnow

end

%% Question 1b

Find int(y,x) from x=[0 4] using composite simpson 1/3

syms x;

fun = @(x)x\*exp(2\*x);

n = 10;

a = 0; x0 = a;

b = 4;

h = (b-a)/n;

for i=1:n

val = val + simpson\_comp(fun, x0, h);

x0 = x0 + h;

end

% using this defined in simpson\_comp.m

% function [Y1] = simpson\_comp(Y, x0, h)

% syms x;

%

% A = h\*(1/3);

% x1 = x0;

% x2 = x0+0.5\*h;

% x3 = x0+h;

%

% k1 = Y(x1);

% k2 = Y(x2);

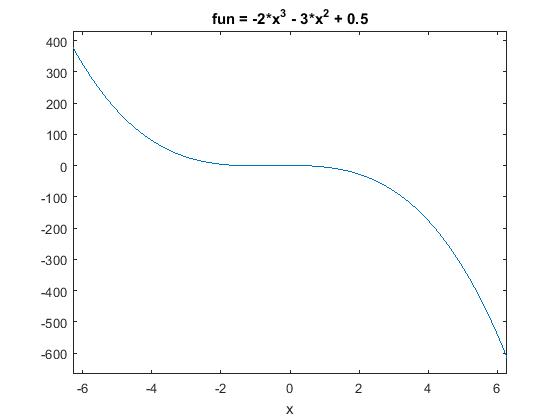
% k3 = Y(x3);

%

% Y1 = A\*(k1 + 2\*k2 + k3);

% end

%OUTPUT: 1.1332e+04



%% Question 1c

% Find the roots, max and min for the following function using newton

% rraphson method

syms x;

fun = @(x) -2\*x^3 - 3\*x^2 + 0.5;

tolerance = 0.01;

figure(1);

ezplot(fun); title('fun = -2\*x^3 - 3\*x^2 + 0.5');

axis = ([-200 20 -20 20]);

fdiffx = diff(fun,x);

x0 = 2;

OK=1; i = 1; error = 100;

while(OK)

x1 = x0 - (subs(fun,x,x0)/subs(fdiffx,x,x0));

error = abs((x0-x1)/x1)\*100;

if(error<tolerance) OK = 0; end

i = i+1;

x0 = x1;

end

fprintf('\nGreat! Your root is %f, and has an error of %f\n\n', x0, error);

%OUTPUT:

%Great! Your root is 0.366025, and has an error of 0.03%

% NOT DONE EDITING FOR MAX/MIN

% MATLAB FUNCTION FREEZING ON 'tolerance = 0.5'...

tolerance = 0.5;

start = 2;

x0 = start;

OK=1; i = 1; error = 100;

while(OK)

x1 = x0 - (subs(df,x,x0)/subs(ddf,x,x0));

error = abs((x0-x1)/x1)\*100;

if(error<tolerance) OK = 0; end

i = i+1;

x0 = x1;

end

fprintf('\nGreat! Your max/min is %f, and has an error of %f\n\n', x0, error);

%% Question 2a

% function WCF = WindChill(T, V)

%

% %WCF = 35.7 + 0.6\*T' - 35.7\*V.^0.16 + 0.43\*T'\*V.^0.16;

% [X,Y] = meshgrid(V,T);

% xn = length(X(1,:));

% yn = length(Y(:,1));

% for xi = 1:xn

% for yi = 1:yn

% WCF(xi,yi) = 35.7 + 0.6\*Y(yi) - 35.7\*X(xi).^0.16 + 0.43\*Y(yi)\*X(xi).^0.16;

% end

% end

%

% WCF = [[0,V];T',WCF];

% disp(WCF);

% end

T = -20:5:55;

V = 0:5:55;

WCF = WindChill(T,V);

%OUTPUT:

disp(WCF)

0 0 5.0000 10.0000 15.0000 20.0000 25.0000 30.0000 35.0000 40.0000 45.0000 50.0000 55.0000

-20.0000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000 23.7000

-15.0000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000 26.7000

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-5.0000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000 32.7000

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5.0000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000 38.7000

10.0000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000 41.7000

15.0000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000 44.7000

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55.0000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000 68.7000

%% Question 2b

% Write a program to create a meshgrid and sruface plot of the WCFs with

% the above ranges for temperature and wind speed. Use shading flat and

% your choice of collormap. Tite and label your plot. Note: this does not

% need to be part of your function from a.

T = -20:5:55; %changed it so they’d be equal length…

V = 0:5:75;

%by changing function definition to:

% function [X,Y,WCF] = WindChill(T, V)

%and commenting out this line: WCF = [[0,V];T',WCF'];

% I get to have X Y and Z that work for Q-2a

tn = length(T);

vn = length(V);

%fun = @(V,T) 35.7 + 0.6\*T(1:tn) - 35.7\*V(1:vn).^0.16 + 0.43\*T(1:tn)\*V(1:vn).^0.16;

%fun(V,T);

[V, T, Z] = WindChill(T,V); %returns meshgrid(x,y)

F = 35.7 + 0.6\*T - 35.7\*V.^0.16 + 0.43\*T.\*V.^0.16;

surf(V,T,Z);

