

Contents

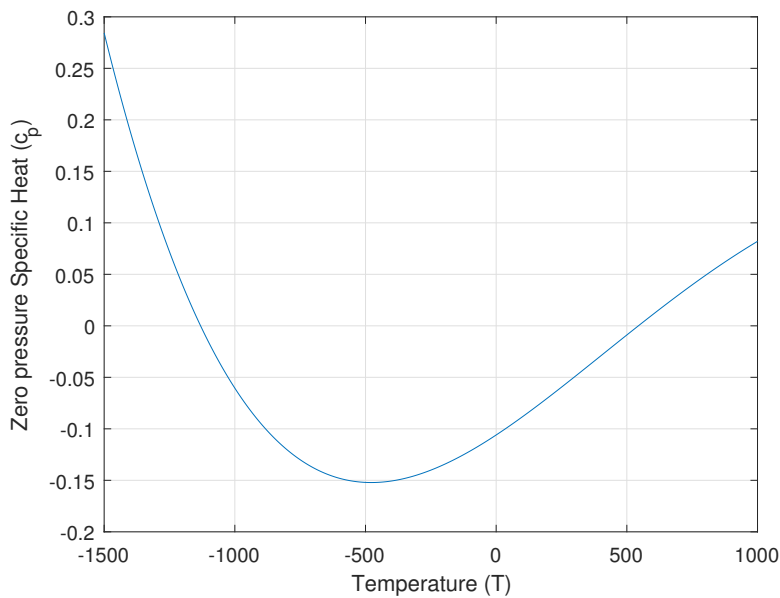
- Plotting graph of function
- Secant Method applied with different intervals.

```
clear all;  
close all;
```

Plotting graph of function

```
g = @(x) -1.1+0.99403+(1.671*10^-4)*x+(9.7215*10^-8)*x^2-(9.5838*10^-11)*x^3+(1.9520*10^-14)*x^4;  
X = -1500:1000; Y = -1500:1000; n = 1;  
for x = -1500:1000  
    Y(n) = g(x);  
    n = n + 1;  
end  
plot(X,Y); grid on;  
xlabel('Temperature (T)');  
ylabel('Zero pressure Specific Heat (c_p)');
```

```
fprintf("Considering the interval [-1500, -1000]\n"); SecantMethod(-1500,-1000);  
fprintf("Considering the interval [400, 600]\n"); SecantMethod(400,600);
```



Secant Method applied with different intervals.

x0,x1 initial approximations to location of root

```

function y = SecantMethod(x0,x1)
    f = inline('-1.1 + 0.99403 + (1.671*10^-4)*x + (9.7215*10^-8)*x^2 - (9.5838*10^-11)*x^3');
    TOL=10^(-10); % absolute error convergence tolerance
    Nmax=100;% maximum number of iterations to be performed
    flag=0;
    older = x0; old = x1;
    folder = feval(f,older);
    for i = 2 : Nmax
        fold = feval(f,old);
        dx = fold * ( old - older ) / ( fold - folder );
        new = old - dx;
        fprintf('\t\t\t %3d \t %.15f \n', i, new )
        if ( abs(dx) < TOL )
            flag=1;
            break
        else
            older = old;
            old = new;
            folder = fold;
        end
    end
    if flag == 0
        disp('Maximum number of iterations exceeded')
    end
end

```

```

2   -1087.706301249115800
3   -1138.029509542062000
4   -1130.693760893146000
5   -1131.025602676162600
6   -1131.028101492426900
7   -1131.028100596541900
8   -1131.028100596544200
Considering the interval [400, 600]
2   544.867997840782210
3   544.081498954654420
4   544.087538233961940
5   544.087537655509440
6   544.087537655508980

```