```
%% Data
Tp=[-1.6,7.6,15.4,26.1,42.2,60.6]; % Degrees Celsius
VP=[20,40,60,100,200,400]; %% mm Hg
T=25; % Degrees Celsius

%% Part a
slope=(100-60)/(26.1-15.4);
lvp=@(T) slope*(T-15.4)+60;
linear_vp25=lvp(25);

fprintf('Using linear interpolation, the vapor pressure at %2.0f degrees Celsius is:
%3.3f mm Hg\n', T, linear_vp25);

%% Part B
A=[1, Tp(3), Tp(3)^2;...
   1, Tp(4), Tp(4)^2;...
   1, Tp(5), Tp(5)^2];

b=[VP(3);VP(4);VP(5)];

qinter_constants=A\b;
a=qinter_constants(1); b=qinter_constants(2); c=qinter_constants(3);

quadratic_vp25=a+b*T+c*T^2;

fprintf('Using quadratic interpolation, the vapor pressure at %2.0f degrees Celsius
is: %3.3f mm Hg\n', T, quadratic_vp25);

%% Part C
spline_vp25=spline(Tp,VP,T);
fprintf('Using spline interpolation, the vapor pressure at %2.0f degrees Celsius is:
%3.3f mm Hg\n', T, spline_vp25);
```

```
Using linear interpolation, the vapor pressure at 25 degrees Celsius is: 95.888 mm Hg
Using quadratic interpolation, the vapor pressure at 25 degrees Celsius is: 94.913 mm
Hg
Using spline interpolation, the vapor pressure at 25 degrees Celsius is: 95.064 mm Hg
```

```
%% Initializing Data
PS=[10,15,20,25,30,35];
IoR=[1.3479,1.3557,1.3639,1.3723,1.3811,1.3902];

Sol_PS=spline(IoR,PS,1.3606);

fprintf('At an index of refraction of 1.3606, the composition is %2.2f percent
sucrose\n', Sol_PS)
```

At an index of refraction of 1.3606, the composition is 18.01 percent sucrose

```
%% Initializing Data
T=100:100:1500;
Cp=[40.06,43.48,46.41,48.9,50.99,52.73,54.15,55.32,56.26,57.03,57.67,58.23,58.75,59.2
7,59.84];

%% Part A
Tint=trapz(T,Cp);

fprintf('Using TrapezoidsThe change in enthalpy from 100 Degrees Celsius to 1500
degrees Celsius is %5.0f J/gmol\n', Tint)

%% Part B
Sint=0;
for i=1:length(T)
    if i==1
        Sint=Sint+Cp(i);
    elseif i==length(T)
        Sint=Sint+Cp(i);
    elseif mod(i,2)==0
        Sint=Sint+4*Cp(i);
    else
        Sint=Sint+2*Cp(i);
    end
end

fprintf('Using Simpsons Rule, The change in enthalpy from 100 Degrees Celsius to 1500
degrees Celsius is %5.0f J/gmol\n', Sint*100/3)
```

Using TrapezoidsThe change in enthalpy from 100 Degrees Celsius to 1500 degrees Celsius is 74914 J/gmol

Using Simpsons Rule, The change in enthalpy from 100 Degrees Celsius to 1500 degrees Celsius is 74940 J/gmol