Dr. Leon VanDommelen (10/08/19) 2

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IMPORTANT:

Do not change **anything** in this header (besides your name and exam date above as needed)!

Put your solution to the question completely at the end of this file.

EXAM 1, Question 2

```matlab
if ~exist('___code___','var') ; clear ; end
format compact
more off
```

SOLUTION:

```matlab
% form the table
table=[
     5    0.872  147.117    8.9496
    10    1.228  106.376    8.7498
    15    1.705   77.924    8.5569
    20    2.339   57.789    8.3706
    25    3.169   43.358    8.1905
    ]

% take the relevant values out of it
TValues=table(:,1);
intValues=table(:,4)./table(:,3);
PDiffExact=table(end,2)-table(1,2)

% spline interpolate to get plot values
TPlot=linspace(5,25,101);
intPlot=spline(TValues,intValues,TPlot);

% plot
plot(TValues,intValues,'ko',TPlot,intPlot,'--r')
axis([-Inf Inf 0 0.2])
xlabel('T')
ylabel('sfg/vfg')
title('Clausius-Clapeyron Integrand')
grid on
legend('tabulated',...
       'spline interpolate',...
       'location','southeast')

% let integral find the integral
```
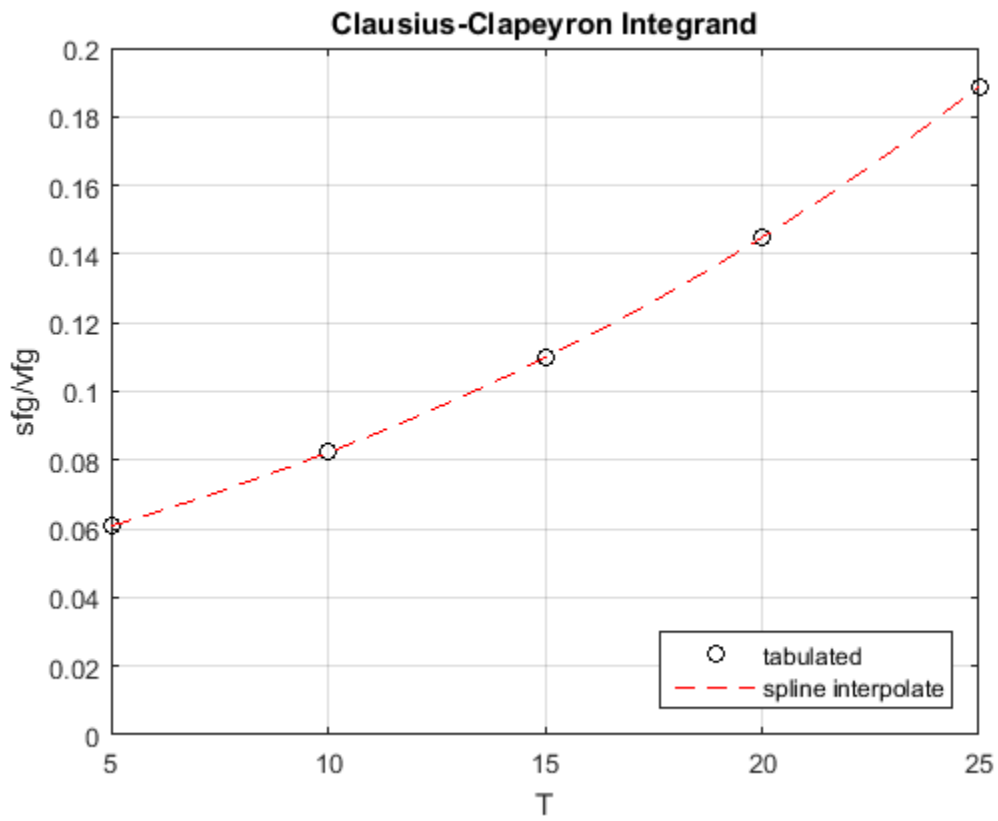
```
PDiffSpline=integral(...
    @(T) spline(TValues,intValues,T),...
    TValues(1),TValues(end))
error=PDiffSpline-PDiffExact
PDiffLinear=integral(...
    @(T) interp1(TValues,intValues,T),...
    TValues(1),TValues(end))
error=PDiffLinear-PDiffExact

table =
     5.0000    0.8720  147.1170    8.9496
    10.0000    1.2280  106.3760    8.7498
    15.0000    1.7050   77.9240    8.5569
    20.0000    2.3390   57.7890    8.3706
    25.0000    3.1690   43.3580    8.1905
PDiffExact =
     2.2970
PDiffSpline =
     2.2963
error =
   -7.2748e-04
PDiffLinear =
     2.3089
error =
     0.0119
```


Clausius-Clapeyron Integrand

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