```
% Problem 1 %

P1=100;
R=0.287;
T1=273;
n=1.4;
r=10;
V1=100;

% State 1 % Compressor

v1 = (R*T1)/P1;
P2 = r*P1;
C=(P1*(v1^n));
v2 = (C/1000)^(1/n);
f = @(x) (1/(x)^n);
Work = -182.354;
T2= (P2*v2)/R;

% State 2 % Combuster

P3 = P2;
T3 = 1300 + 273;
T4 = T3 - (T2-273);
H3 = ((1757.33 - 1696.45)/(1600-1550)) * (T3 - 1500) + 1696.45;


% State 3 % Turbine

Wout = - Work;

k = (1/0.4);
v3 = (R * T3)/P3;
v4 = ((P3 * (v3^n))/(R*T4))^(k);
P4 = (R * T4)/v4;

% Nozzle %

P5 = P1;
v5 = ((P4*(v4^n))/P5)^(1/n);
T5 = (P5*v5)/R;
H4 = ((1455.43 - 1395.89)/50) * (T4-1300) + 1395.89;
H5 = ((877.4 - 822.2)/50) * (T5-800) + 822.2;

% First Law %

Vfinal = (2000 * (H4 + ((V1^2)/2000) - H5))^(0.5)


Vfinal =

   1.0816e+03
```

```
% Problem 2

% 1 = boil-turb 2 = turb-cond
% 3 = cond-pump 4 = pump boil

% Constants %

P2 = .04;
P3 = P2;
P4 = 20;

% State 2 %

v2 = XSteam('vV_p', P2);

s2 = XSteam('sV_p',P2);

h2 = XSteam('hV_p',P2);

% State 3 %

v3 = XSteam('vL_p', P3);

s3 = XSteam('sL_p', P3);

h3 = XSteam('hL_p', P3);

% State 4 %


v4 = (P3*(v3^1.4)/(P4))^(1/1.4);

s4 = s3;

h4 = XSteam('h_ps',P4,s4);


% State 1 %

P1 = P4;

s1 = s2;

h1 = XSteam('h_ps',P1,s1);

% Work of Turbine %

W = 1000000;

massflow = W/(h1-h2)
```

```
massflow =

  517.0317
```

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