{Question 6.145}

```
T_1=290[K]
P_1=100[kPa]
P_2=330[kPa]

effiiceincy=0.903
effiiceincy=W_s/W
W_s=h_2s-h_1
W=h_2-h_1

h_1=enthalpy(Air, T=converttemp(K,C,T_1))
s_1=entropy(Air, T=converttemp(K,C,T_1), P=P_1)
s_1=s_2s
h_2s=enthalpy(Air, P=P_2, s=s_2s)
```

{Using the isentropic efficeincy equation it is possible to find h_2 and then W}
{Work Input: W = 131.1 kJ/kg}

{Alternatively, you can solve this problem using the equation P_2/P_1=P_r2/P_r1, where P_r represents Relative Pressure which can be found on most thermodynamic property tables for ideal gasses}

SOLUTION

Unit Settings: SI C kPa kJ mass deg

effiiceincy = 0.903	h_1 = 290.4 [kJ/kg]	h_2 = 421.5 [kJ/kg]
h_{2s} = 408.8 [kJ/kg]	P_1 = 100 [kPa]	P_2 = 330 [kPa]
s_1 = 5.672 [kJ/kg-K]	s_{2s} = 5.672 [kJ/kg-K]	T_1 = 290 [K]
W = 131.1 [kJ/kg]	W_s = 118.4 [kJ/kg]	

No unit problems were detected.
EES suggested units (shown in purple) for h_1 h_2 h_2s s_1 s_2s .