$W_{net} = (-61.85) + (-439.4) + 552.5 = 51.25 \frac{kJ}{kg}$

$q_{net} = 2343.73 - 3762.6 = -1418.87 \frac{kJ}{kg}$

(c) $\eta_{th} = \frac{552.5}{2343.73} = 0.23$

-22 $T_H = 1100K$ $P_H = 3000 kPa$ $m = 0.6 kg$

$T_L = 300K$ $P_L = 20 kPa$

$C_p = 1.005 \frac{kJ}{kg \cdot K}$ $R = 0.287 \frac{kJ}{kg \cdot K}$

$P_2 = P_L \left(\frac{T_H}{T_L}\right)^{\frac{k}{k-1}} = P_2 = 20\left(\frac{1100}{300}\right)^{\frac{1.4}{1.4-1}} = 1887.9 kPa$

$S_2 - S_1 = (-0.287) \ln\left(\frac{1887.9}{3000}\right) = 0.1329 \frac{kJ}{kg \cdot K}$

$q_{in} = (0.6)(1100)(.1329) = 87.73 kJ$

$\eta_{th} = 1 - \frac{300}{1100} = 72.72\%$ $W_{net} = (0.7273)(87.73) = 63.81$

-31C The main difference between fuel-injector gasoline engines and diesel engines is the ignition method. Diesel engines run off of compression ignition, while gasoline engines use spark-ignition.