P # 32 Ch 12 - pg 385

a) $T_H = 350°C = 623\,K$

$T_C = 80°C = 353\,K$

$Q_H = 21{,}000\,J$

$t = 1.00\,sec$

Find e:

$$e_C = \frac{T_H - T_C}{T_H} = \frac{623K - 353K}{623K} = 43.3\%$$

Find W:

$$e = \frac{W}{Q_H} \quad so \quad .433 = \frac{W}{21000\,J}$$

$$W = 9101\,J$$

Find P:

$$P = \frac{W}{t} = \frac{9101\,J}{1.00\,s}$$

$$\boxed{P = 9100\,W}$$

b) $W = Q_H - Q_C$ so $Q_C = Q_H - W$

$= 21000\,J - 9100\,J$

$$\boxed{Q_C = 11{,}900\,J}$$