Physics 102 Rec
Quiz # 3
Chapter 19

Date: 19 March 2002

Name: Key Id: Sect:

1. A silver bar of length 30 cm and diameter 10 mm is used to transfer heat from a 100 °C reservoir to a 0 °C reservoir. How much heat is transferred per hour? (Thermal condictivity of silver = 427 W/ m °C)

$$H = \frac{Q}{t} = \frac{K A \Delta T}{L}$$

$$\Rightarrow Q = H * t = \frac{K A \Delta T}{L} * t$$

$$= \frac{(427)(\pi r^2)(100-0)}{0.3} \times 3600$$

$$= \frac{427 \times \pi \times (5\times10^{-3})^2 (100)}{0.3} \times 3600$$

$$\boxed{Q = 40244\ J}$$

2. ~~Five moles of an ideal gas are compressed isothermally at 127 °C to half the initial volume. Find the work done by the gas during the process.~~

$$W = n R T \ln\left(\frac{V_f}{V_i}\right)$$

$$= 5 \times 8.31 \times 400 \times \ln\left(\frac{1}{2}\right) = -11520\ J$$

$$\boxed{W = -11520\ J}$$