Chemistry 236
Calibration Study Problems -- Answers

1. c   [Note that $P(\text{torr})$ $P_{atm}(\text{torr}) + h(\text{mm}) = 750$ torr $+ h$.]

2. $317._5$ torr.

3. 200.4 torr. (See pp. 205 and 630 of SGN.)

4. Let $R = a \exp(b/T)$. The two calibration points (T in K) yield $b = 4984.89$ and $a = 1.46775 \times 10^{-4}$, from which $t = 4.96_6°C$ for the bath.

5. The correction term is 0.004, which means 0.4%. The correction is negative, which means the true P is less than the apparent P.

6. $E/2k$ 5.7×10^3 K; E 95 kJ/mol. [Do NOT just scale the value given after eqn (1); use this eqn with $T_1 = 293.15$K, $T_2 = 294.15$K, $R_2 = R_1*(1.000\pm0.064)$; which is it?]

7. Our devices for measuring P and T and recording these in the computers are accurate enough to give a satisfyingly straight line in a plot of true *vs.* apparent. However, the precision of measurement is high enough to show clear systematic deviations from the simple straight line, as exhibited in the recommended difference plots (and illustrated on p. 6). The resolution of typical displays is just insufficient to show the systematic deviations from the straight line in the linear plot.

8. $P = 1.78_5$ Torr (neglecting T corrections to both densities;   given in writeup).