Chapter 10 Answers

1. (a) See spreadsheet Chapter_10.xls.

   (d) Forcing a linear fit of $RT \ln \gamma_B$ vs. x_A^2 to go through (0,0) gives a slope of $w_G = -1940.9\,\mathrm{J\,mol^{-1}}$.

   (e)
   $$\gamma_B = e^{\frac{w_G(1-x_B)^2}{RT}}$$
   so
   $$a_B = e^{\frac{w_G(1-x_B)^2}{RT}} x_B$$

   (f)
   $$\frac{da_B}{dx_B} = e^{\frac{w_G(-1+x_B)^2}{RT}} \left(-2\,w_G x_B + 2\,w_G x_B^2 + RT\right) R^{-1} T^{-1}$$
   At $x_B = 0$, $da_B/dx_B = 0.4571$

   (g) See spreadsheet Chapter_10.xls.

2. (a) See spreadsheet Chapter_10.xls.

   (e) $w_{G_1} = 6208\,\mathrm{J\,mol^{-1}}$
   $w_{G_2} = 2368\,\mathrm{J\,mol^{-1}}$

   (g) Henry's Law slope is 2.352.