Name and Block:_____

Answer each of the following in the space provided.

1. For the following reactions, write the equilibrium constant expression (K_c) in terms of concentrations:

   (a) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

   (b) $CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$

   (c) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$

2. For the reaction $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$, the following equilibrium concentrations are measured:

   $$[H_2] = 0.200\,\text{M}, \quad [I_2] = 0.150\,\text{M}, \quad [HI] = 0.600\,\text{M}.$$

   Calculate the equilibrium constant K_c for the reaction.

3. For the reaction $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$, the equilibrium constant K_c is very large ($K_c \approx 1 \times 10^5$) at 298 K.

   (a) Is the forward or reverse reaction favored at equilibrium? Explain briefly.

   .....
   .....
   .....
   .....
   .....
   .....
   .....

   (b) Sketch a particle diagram representing the reaction container at equilibrium.