Equilibrium Worksheet

1. For the following reactions at equilibrium:

$$H_2(g) + I_2(g) \rightleftharpoons 2\,HI(g)$$

1) Predict the shift in equilibrium when more HI(g) is added to the system.

2) How will the concentration of I_2 change?

2. For the reaction below, predict the direction the equilibrium will shift given the following changes. Temperature and volume are held constant.

$$2\,NO2(g) + 7\,H_2(g) \rightleftharpoons 2\,NH_3(g) + 4\,H_2O(g)$$

1. Addition of ammonia (NH_3)
2. Removal of nitrogen dioxide (NO_2)
3. Removal of water vapour
4. Addition of hydrogen

3. $AgCl_{(s)} \rightleftharpoons Ag^+_{(aq)} + Cl^-_{(aq)}$

Predict the direction of equilibrium shift for:

a. Increase $[Ag^+]$
b. Decrease $[Ag^+]$
c. Increase $[Cl^-]$
d. Decrease $[Cl^-]$
e. Add solid $AgNO_3$
f. Add solid $NaNO_3$

4. Find the Q value for the initial reaction and the K value for the reaction at equilibrium.

$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

	H_2	I_2	HI
Initial (M)	1.00	1.00	0
Change (M)	-0.666	-0.666	1.33
Equilibrium (M)	0.334	0.334	1.33