Equilibrium Constant Practice #2

Part I: Write the equilibrium constant expression for the following reactions:

1)
$$3O_2(g) \leftrightarrows 2O_3(g)$$

$$K=$$

2)
$$HCl(aq) + H_2O(1) \stackrel{\checkmark}{\Longrightarrow} H_3O^+(aq) + Cl^-(aq)$$

3)
$$ZnO(s) + CO_2(g) \rightleftharpoons ZnCO_3(s)$$

4)
$$H_2O(g) + C(s) \stackrel{\checkmark}{\Longrightarrow} CO(g) + H_2(g)$$

$$K=$$

5)
$$CaSO_4(s) \Leftrightarrow Ca^{2+}(aq) + SO_4^{2-}(aq)$$

6)
$$CH_3NH_2(aq) H_2O(1) \leftrightarrows CH_3NH_3^+(aq) +OH^-(aq) K=$$

$$7) \ C(s) + CO_2(g) + 2Cl_2(g) \leftrightarrows 2COCl_2(g)$$

$$K=$$

8)
$$BeCO_3(s) \leftrightarrows BeO(s) + CO_2(g)$$

$$K=$$

9)
$$2HBr(g) \rightleftharpoons H_2(g) + Br_2(l)$$

$$K=$$

10)
$$AgCl(s) \hookrightarrow Ag^{+}(aq) + Cl^{-}(aq)$$

$$K=$$

Part II: Calculating equilibrium constants

1) This equation:

$$N_2(g) + 3H_2(g) \leftrightarrows 2 NH_3(g)$$

describes a reaction that was carried out at high temperature with the following results:

Trial	N ₂	H ₂	NH_3
1	0.90	0.600	0.0441
2	0.80	0.500	0.0316
3	0.70	0.400	0.0212

Verify that the equilibrium constant for this is constant by calculating the value for all three trials.

2) This equation:

$$3O_2(g) \leftrightarrows 2O_3(g)$$

describes a reaction that was carried out at high temperature with the following results:

Trial	O_2	O_3
1	0.100	0.0274
2	0.200	0.0775
3	0.300	0.142

Calculate the equilibrium for all three trials.

3) This equation:

$$Br_2(g) \leftrightarrows 2Br(g)$$

describes a reaction that was carried out at 100°C with the following results:

Trial	Br ₂	Br
1	0.250	0.0791
2	0.500	0.112
3	0.750	0.137

Calculate the equilibrium for all three trials.

4) This equation:

$$2NOBr(g) \leftrightarrows 2NO(g) + Br_2(g)$$

describes a reaction that was carried out at high temperature with the following results:

Trial	NOBr	NO	Br_2
1	0.25	3.95	0.10
2	0.50	5.59	0.20
3	0.75	6.85	0.30

Calculate the equilibrium for all three trials.