1. Consider the following system at equilibrium:

$$\text{CO(g)} + \text{O}_2(g) \rightleftharpoons \text{CO}_2(g)$$

Predict the effect of the following changes when the system is initially in a state of equilibrium. Assume that the reaction container volume remains constant. (Do not forget to balance the chemical equation).

(a) Carbon dioxide gas is added to the system.

$$2 \text{CO(g)} + \text{O}_2(g) \rightleftharpoons 2 \text{CO}_2(g)$$

*Shifts left toward reactants*

(b) Pressure is increased.

*Shifts right toward products*

(c) Carbon monoxide gas is removed from the system.

*Shifts left toward reactants*

(d) Write the equilibrium constant expression for this reaction. (Do not forget to balance the chemical equation).

$$K = \frac{[\text{CO}_2]^2}{[\text{CO}]^2 [\text{O}_2]}$$