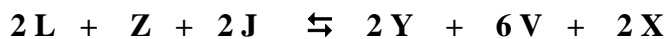


### Equilibrium Worksheet #3

Reaction #1	$A + B \rightleftharpoons C + 2D$	$K_1 = 5.0$
Reaction #2	$2X + 2Y \rightleftharpoons Z$	$K_2 = 3.0$
Reaction #3	$F + 3G \rightleftharpoons 4R$	$K_3 = 2.0$
Reaction #4	$E + 2K \rightleftharpoons M$	$K_4 = 4.0$
Reaction #5	$4W + 2T \rightleftharpoons Q$	$K_5 = 7.0$
Reaction #6	$J + L \rightleftharpoons 3V$	$K_6 = 9.0$

1. Based on the information above, what is the equilibrium constant for the following?



$$K = 27$$

2. Based on the information above, what is the equilibrium constant for the following?



$$K = 1.6$$

3. Based on the information above, what is the equilibrium constant for the following?

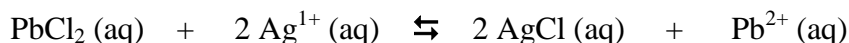


$$K = 0.31$$

4. The following equilibrium constants have been determined for equilibrium reactions at 25°C.

<b>Rxn 1</b>	$\text{AgCl (aq)} \rightleftharpoons \text{Ag}^{1+} \text{ (aq)} + \text{Cl}^{1-} \text{ (aq)}$	$K_1 = 1.8 \times 10^{-10}$
<b>Rxn 2</b>	$\text{PbCl}_2 \text{ (aq)} \rightleftharpoons \text{Pb}^{2+} \text{ (aq)} + 2 \text{Cl}^{1-} \text{ (aq)}$	$K_2 = 1.2 \times 10^{-4}$

Calculate the equilibrium constant for the following reaction at the same temperature:

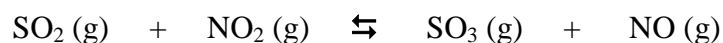


$$K = 3.7 \times 10^{15}$$

5. The following equilibrium constants have been determined for equilibrium reactions at 25°C.

<b>Rxn 3</b>	$\text{SO}_2 \text{ (g)} + \frac{1}{2} \text{O}_2 \text{ (g)} \rightleftharpoons \text{SO}_3 \text{ (g)}$	$K_3 = 2.2$
<b>Rxn 4</b>	$\text{NO (g)} + \frac{1}{2} \text{O}_2 \text{ (g)} \rightleftharpoons \text{NO}_2 \text{ (g)}$	$K_4 = 0.25$

Calculate the equilibrium constant for the following reaction at the same temperature:

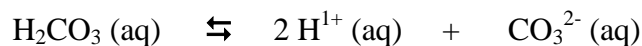


$$K = 8.8$$

6. The following equilibrium constants have been determined for equilibrium reactions at 25°C.

<b>Rxn 5</b>	$\text{H}^{1+} \text{ (aq)} + \text{CO}_3^{2-} \text{ (aq)} \rightleftharpoons \text{HCO}_3^{1-} \text{ (aq)}$	$K_5 = 1.8 \times 10^{10}$
<b>Rxn 6</b>	$\text{H}^{1+} \text{ (aq)} + \text{HCO}_3^{1-} \text{ (aq)} \rightleftharpoons \text{H}_2\text{CO}_3 \text{ (aq)}$	$K_6 = 2.3 \times 10^6$

Calculate the equilibrium constant for the following reaction at the same temperature:



$$K = 2.4 \times 10^{-17}$$