

# Problem 1

Calc We see that

$$K = 8.3 \cdot 10^{-4} = \frac{[CO][Cl_2]}{[COCl_2]} = \frac{[CO]^2}{[COCl_2]} \Rightarrow [CO] = [Cl_2] = 0.0407$$

and then

$$[COCl_2] = 2.00 M - 0.0407 M = 1.9593$$

## Problem 2

(a): To the products

(b): To the reactants

### Problem 3

Eq:  $0.0142 = \frac{[NO]^2 [Br_2]}{[NOBr]^2}$   ~~$= \frac{[NO]^2}{[NOBr]^2} \cdot [Br_2]$~~   ~~$= \frac{[NO]^2}{[NOBr]^2} \cdot 0.305$~~

Let's try writing a table:

NOBr	Br <sub>2</sub>	NO
2	0	0
-2x	+x	+2x

Plug in:

$$0.0142 = \frac{4x^3}{4 + 9x^2 - 6x}$$

$$4 \cdot 0.0142 + 9 \cdot 0.0142 \cdot x^2 - 6 \cdot 0.0142 x = 4x^3$$

By a TI-84,  $x = 0.227$  and thus

$$[Br_2] = 0.227$$

$$[NO] = 0.454$$

$$[COCl_2] = 1.319$$