

# Differential Rate Law Wksht.

$$5. \frac{4.29 \times 10^{-9}}{2.41 \times 10^{-9}} = \frac{[8.0 \times 10^{-3}]^n}{[6.0 \times 10^{-3}]^n} \quad 1.78 = 1.33^n \quad \log 1.78 = n(\log 1.33)$$

$$n = 2.0$$

$$\text{rate} = k [HI]^2 \quad \text{order} = 2$$

$$4.29 \times 10^{-9} = k [8.0 \times 10^{-3}]^2 \quad k = 6.7 \times 10^{-5}$$

$$6. a) \text{rate} = k [X]^n$$

$$a) \frac{0.014}{x} = \frac{k [0.50]^0}{k [0.10]^0} \quad \frac{.014}{x} = \frac{1}{1} \quad \text{rate} = .014 \text{ mol/L} \cdot \text{sec}$$

$$b) \frac{0.014}{x} = \frac{k [0.50]^1}{k [0.10]^1} \quad \frac{.014}{x} = \frac{.5}{.1} \quad \text{rate} = .0028 \text{ mol/L} \cdot \text{sec}$$

$$c) \frac{0.014 \text{ mol}}{x \text{ L} \cdot \text{sec}} = \frac{k [0.50 \text{ mol/L}]^2}{k [0.10 \text{ mol/L}]^2} \quad \frac{.014}{x} = \frac{25}{1} \quad \text{rate} = 5.6 \times 10^{-4} \text{ mol/L} \cdot \text{sec}$$

$$7. \text{rate} = k [A]^n$$

$$a) .50 = \frac{k [0.05]^n}{k [0.10]^n} \quad .50 = .5^n \quad n = 1$$

$$b) 1.00 = \frac{k [0.05]^n}{k [0.10]^n} \quad 1.00 = .5^n \quad n = 0$$

$$c) 0.25 = \frac{k [0.05]^n}{k [0.10]^n} \quad .25 = .5^n \quad n = 2$$