

Problem 13.33, p 570



$$\text{Rate} = k [A]^x$$

Initial rate experiments...

- a) If we triple (A), no change in reaction rate. What is order?

$$k [A]^x = k [3A]^x$$

$$1 = 3^x, \text{ so } x = 0$$

This one is ZERO ORDER with respect to A.

- b) If we double (A), reaction rate doubles. What is order?

$$2k [A]^x = k [2A]^x$$

$$2 = 2^x, \text{ so } x = 1$$

This one is FIRST ORDER with respect to A.



$$\text{Rate} = k [A]^x$$

- Ⓒ If we triple (A), reaction rate goes up by a factor of 27. What is order?

$$27k[A]^x = k[3A]^x$$

$$3^x = 27, \quad x = 3$$

This one is THIRD ORDER with respect to A.