From the world of RedOx:
You are given the following schematic representation of a galvanic cell:

\[
\text{Fe} / \text{FeSO}_4 (0.50 \text{ M}) \parallel \text{Mn}^{+2} (0.10 \text{ M}), \text{MnO}_2(\text{s}), \text{pH} = 1.0 / \text{Pt}
\]

NOTE: The FeSO_4 is a completely soluble salt, while MnO_2 is an insoluble nonconductive solid in its pure state

a) Identify the two electrodes. Which electrode is the cathode, and which is the anode? What are their polarities (+ or -)?

b) Write the two half reactions for this galvanic cell. Which is the oxidation and which is the reduction?

c) Write the overall cell reaction

d) Calculate the reduction potential of each half cell

e) Calculate the overall cell potential, \( E_{\text{cell}} \)
From the world of Kinetics:
By analyzing kinetic data for the reaction $2A + B \rightarrow 2C$, we discover that the reaction has a first order dependence on $A$ and a second order dependence on $B$.

a) What is the mathematical form of a rate law that expresses these facts?

b) If we double the initial concentration of $B$ how will the initial rate change?

c) If the rate of consumption of $A$ is 2.5 M/s, what is the rate of consumption of $B$? What is the rate of production of $C$?

Please write and sign the pledge: