1. A patient was given a 100 mg IV bolus dose every 8 hr. At steady-state, two plasma samples were taken and respective concentrations were measured. The first sample was taken right before administration of the i.v. bolus dose (predose) and the second sample was taken 1 hour post dose ($C_{p1h}$). Measured concentrations for $C_{p1h}$ and $C_{predose}$ were 9.6 mg/L and 2.9 mg/L, respectively. Please calculate the drug’s: elimination rate constant ($k_e$), half-life ($t_{1/2}$), volume of distribution ($V_d$), clearance (CL), and average steady-state concentration ($C_{ss}$).

![Graph.png](attachment:Graph.png)

2. You wish to begin a patient on a constant rate infusion of Drug X. The drug concentration is 10 mg/L before the start of the constant rate infusion. The volume distribution of the patient is 10 L and elimination rate constant is 0.4/hr.

A. Please compute the infusion rate ($k_0$) necessary to achieve a steady state drug concentration ($C_{ss}$) of 20 mg/L.

B. In order to reach the steady-state directly, what should be the loading dose? Remember the drug concentration was 10 mg/L before infusion.

3. True or False

A. For a multiple IV bolus regimen, if the dosing interval is the same, the shorter the half-life the more pronounced the differences between peak and trough concentrations. (T F)

B. For a multiple IV bolus regimen, the longer dosing interval, the longer it will take to achieve steady state. (T F)
C.  For a multiple IV bolus regimen, the accumulation degree is larger in patients with higher clearance. (T F)
D.  It takes more time to reach steady state for a drug with a higher degree of accumulation. (Assuming loading dose is not given, and dosing interval is the same.) (T F)