

Textbook problems:

- §11.2: 18, 22, 30, 31, 32, 34, 35
- §11.3: 2, 4, 8, 12, 13, 16, 17, 18, 19, 22, 32

Supplemental problems:

1. (Based on exercise 70 in §11.2, which was worked out in class.) The amount of time it takes for a medication to leave a patient's bloodstream is sometimes expressed in terms of its *half-life*. The half-life is defined to be the amount of time it takes before the concentration of the medication shrinks by half. If a medication has half-life λ hours, and the concentration immediately after taking a dose of the medication is D , then the concentration of medication remaining from that dose after t hours will be $D \cdot 2^{-t/\lambda}$.
 - (a) If the patient takes a dose D every T hours, and the medication has half-life λ , what is the concentration of medication in the patient's bloodstream immediately after the patient has taken the n th dose?
 - (b) Determine the limiting post-dose concentration (i.e. the patient has been taking one dose every T hours for a very long time, and has just now taken a dose).
 - (c) Determine the limiting *pre*-dose concentration (i.e. when the patient took the last dose T hours ago, and is about to take the next, but has not done so yet).

(The same "important notes" and submission instructions apply as on previous PSets; I'm omitting them from now on to reduce clutter.)