Welcome to our first Calculus with Applications discussion section!

On a piece of paper write:

- Your name.
- How you prefer to be addressed.
- An answer to the following question.

Question

Why do you want to study math?

There are no wrong answers.
Once you have an answer, find someone else and share.

Background

Adderall XR is a version of Adderall designed to release the drug slowly. The effect of taking a slowly released drug is modeled by an immediate increase in drug concentration in the gut followed by a slow transfer of concentration from the gut to the blood stream.

We assume no spikes in blood concentration of Adderall XR after pill consumption.

The Experiment

When the experiment begins, 10 mg of the drug is present in the gut.

The passage of the drug from the gut to the blood has first order kinetics; that is, every hour 42% of the drug remaining in the gut is passed from the gut into the blood.

No more pills are taken, so no extra drug is added to the gut.

Problem 1

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What do the variables represent in the context of this experiment?

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Sequences are defined to be infinite.
Does this make sense in the context of this problem?
Why or why not?

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Does this make sense in the context of this problem?
Why or why not?

(c) Why might we be interested in expressing the amount of Adderall XR in the patient's gut t hours after the pill was taken as a sequence?

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If so, write one down for a_t.

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(b) Can we use the recurrence relation to determine the value of a_{30}?
If we can, is this a reasonable procedure to compute explicit values for a_t's?

Problem 3

Find an explicit general formula for a_t, i.e. a formula for a_t that only depends on t and not any of the previous terms.

Wrap Up

Contact: Joseph Immel - jhimmel@ucsc.edu

Office Hours: Wednesday from 1:30 PM to 3:30 PM in ARC 116

Looking Forward: Exponents, Logarithms, and, soon, Limits!