

SEQUENCES

PROBLEM 3: GETTING RICH

Here's a classic problem. Suppose you were to work every day for a stretch of 30 days. You have two pay options: you can be paid \$1,000 for every day that you work, or you can be paid \$.01 the first day, \$.02 the second day, \$.04 the third day, \$.08 the fourth day, and so on. Which pay plan would you choose and why?

HINT 1: From the main "Recursion" screen, press SHIFT MENU to enter the SET UP and turn the first option, Σ Display, On.

HINT 2: Use a_n for one sequence and b_n for the other.

PROBLEM 4: TAKING YOUR MEDICINE

Suppose that you have an illness that requires you to take 200 milligrams of a medication every 12 hours. Further suppose that during a 12-hour period your body disposes of 80% of the medication in your bloodstream. How much medication is in your bloodstream after 24 hours? After 48 hours? In the long run?

Explore the underlying ideas by changing the dosage and the percent of medication disposed of by your bloodstream.

EXTENSION

Suppose you forget to take your medication one day. Explore what happens if

- A. you just skip that day, or
- B. you try to make up for the day by taking two doses on the following day.

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ENHANCING YOUR WORK WITH A DIGITAL CAMERA

In addition to having students show pictures of themselves solving the problems, a digital camera can be used to enhance the solutions. For *GOING INTO DEBT*, students might take pictures of credit card statements showing different rates of interest. They should, of course, be discreet about the information their pictures reveal, avoiding credit card numbers and the amount of individuals' debts.

A more exciting use of the camera involves work on *THE FIBONACCI SEQUENCE*. After students have conducted their research, they can take pictures of examples they find in nature. For instance, they might take pictures of the spirals on a daisy, using the Macro setting (the flower icon) on the camera for a close-up. As they should learn, examples abound in nature, and the documentation they can provide with the digital camera can help students see how mathematics is truly connected to the world around them.