Math 146 - Calculus II   Name_____
Easy as 123

A lot of processes are best modeled by sequences (lists of numbers) rather than by continuous functions. Today we'll begin looking at sequences and how they are used.

1. A 64 GB USB flash drive currently costs about \$15. An economist predicts that the price will decrease by 4% each year.

    (a) What is the predicted price next year?

    (b) Let's let P_n be the price in year n. So $P_1 = 15$. Find P_2, P_3, and P_4.

    (c) Give a formula for P_n.

    (d) What is P_{16}?

    (e) What is $\lim\limits_{n\to\infty} P_n$? Does that make sense?

2. Let F_n be the number of fish in a fishery after n months, with $F_0 = 4000$ fish. Each month the number of fish grows by 1.5% and then 80 fish are harvested.

(a) Find F_1 and F_2.

(b) We can describe this sequence with a recursive formula, where each term depends on the previous term in the sequence. Explain why the formula

$$F_n = 1.015F_{n-1} - 80 \qquad F_0 = 4000$$

fits this problem. Check your values of F_1 and F_2.

(c) Calculate F_3 and F_4 using the formula.

(d) Do you think the fish population will grow or shrink in the long run?

(e) Is your prediction different if $F_0 = 6000$? Show some calculations.