Name: _____ Date: _____

6.2 Recursive Procedures

BLM 6–5

1. Write the first four terms in each sequence.

a) $t_1 = 11,\ t_n = t_{n-1} + 2$

b) $t_1 = 729,\ t_n = \dfrac{t_{n-1}}{3}$

c) $t_n = -2,\ t_n - 4t_{n-1} + n^2$

d) $t_1 = 1,\ t_n = -2t_{n-1} + 2n$

2. Determine a recursion formula for each sequence.

a) 4, 7, 10, 13, …

b) 3, 8, 15, 24, 35, …

c) 1, 8, 27, 64, 125, …

d) 2, 6, 15, 31, 41, …

3. On an investment of $5000, interest is compounded annually and calculated at the end of each calendar year. The financial institution is offering compound interest at 6% per year.

a) Write the value of the investment for the first 7 years as a sequence.

b) Write a recursion formula to represent the value of the investment.

c) Use this formula to predict the value of the investment after 12 years.

4. Write the first four terms in each sequence.

a) $t_1 = 256,\ t_n = \sqrt{t_{n-1}}$

b) $t_1 = 2,\ t_2 = 3,\ t_n = t_{n-1} \times t_{n-2}$

c) $t_1 = 2,\ t_2 = 4,\ t_n = \left(t_{n-1}\right) - 3t_{n-2}$

d) $t_1 = 0,\ t_n = 2^{-\left(t_{n-1}\right)}$

5. The expression $n!$ is read "n factorial" and has the value given by the product $n(n-1)(n-2)(n-3)\ \ldots\ (2)(1)$.

a) The terms of a sequence can be written as a recursive formula where $t_1 = 1$ and $t_n = n \times t_{n-1}$. Write the first five terms of this sequence.

b) Show that each of these numbers is a factorial number.

6. A sequence starts with a value of 3. Each succeeding term is two less than four times the previous term.

a) Write the first four terms of this sequence.

b) Write a recursion formula for the sequence.

c) Create a graph of the sequence.

7. Dana finds out that her best friend has just accepted an offer from Carleton University in Ottawa. She tells two friends. These two friends each tell two more people, and these people each tell two others, and so on.

a) Write the terms of the sequence that represent the number of people who are told of the decision in each step.

b) Write a recursion formula for this.

c) Is this an example of continuous or discrete data? Explain.

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