STAM September 9, 2011 TJ Middleton

Partial Review: Intro to Recursion

Determine the next three terms in each sequence and specify which type of sequence the pattern represents. Then describe the pattern **verbally**.

1) 29, 26, 23, 20, …

2) 3, 4, 7, 11, 18, …

Determine the next three terms in each sequence and specify which type of sequence the pattern represents. Then describe each sequence with a recursive formula.

3) 125, 100, 80, 64, …

4) 5, 7, 11, 19, 35, …

5) 9, 10, 12, 15, 19, 24, …

Determine the 13th and the 83rd term in each recurrence relation described below.

6) $\begin{cases} a_1 = 24 \\ a_i = \dfrac{i}{i+1} a_{i-1} \end{cases}$

7) $\begin{cases} M_1 = 32 \\ M_k = \dfrac{3}{2} M_{k-1} + 4 \end{cases}$

Supply the missing terms in each sequence given the specified type of sequence.

8) Geometric: 8 __ __ 27

9) Arithmetic: 15 __ __ __ 59

Complete the following application problem.

10) A patient is initially given 40 mg of a medicine. Each hour thereafter, 20% of the medicine is eliminated from the body and the patient is given another 5 mg dose.

a) Write a recursive formula for the amount of medicine in the patient's body each hour.
b) Provide a table showing the first five terms of the sequence.
c) What is the level of medicine in the patient's body after 7 hours?
d) Draw a graph of the amount of medicine in the patient's body during the first 10 hours. Does a sequence of dots accurately represent this scenario? If you connected the dots with a smooth decreasing curve, would this correctly represent the amount of medicine in the body?
e) When does the patient first have less than 26 mg of the medicine in his or her body?
f) What happens over time to the level of medicine in the patient's body?