

I. Find the first five terms of each given recursive sequence. Write answer as a sequence.

1.) $a_{n+1} = 6 - a_n$; $a_1 = -4$ $-4, 10, -4, 10, -4, \dots$	2.) $a_{n+1} = 2a_n + 7$; $a_1 = -3$ $-3, 1, 9, 25, 57, \dots$	3.) $a_{n+1} = a_n - 3n + 1$; $a_1 = 5$ $5, 3, -2, -10, -21, \dots$
4.) $a_n = 4a_{n-1} - 2$; $a_1 = 2$ $2, 6, 22, 86, 342, \dots$	5.) $a_n = 3(a_{n-1} - 2)$; $a_1 = 7$ $7, 15, 39, 111, 327, \dots$	6.) $a_n = 4 - (a_{n-1} + 3)$; $a_1 = -2$ $-2, 3, -2, 3, -2, \dots$
7.) $a_{n+1} = a_n - a_{n-1}$; $a_1 = -1, a_2 = -1$ $-1, -1, 0, 1, 1, \dots$	8.) $a_{n+1} = -4a_n + a_{n-1}$; $a_1 = 3, a_2 = -5$ $3, -5, 23, -97, 411, \dots$	9.) $a_n = 2a_{n-1} + 3a_{n-2}$; $a_1 = 1, a_2 = 2$ $1, 2, 7, 20, 50, \dots$

II. Complete each problem about recursive and/or explicit sequences.

10.) Write the recursive formula: $1, 3, 6, 10, 15, \dots$ $a_n = a_{n-1} + n, a_1 = 1$	11.) Iteration is the process of composing a function with itself. Using that idea, find the first 3 iterates (x_1, x_2, x_3) for $f(x) = 2x + 3$ where $x_0 = 1$. $5, 13, 29$
12.) Given: $a_n = 2(3a_{n-1} + 5) - 10$ where $a_1 = 4$ Write the explicit formula. $a_n = 4(6)^{n-1}$	13.) Given: $a_{n+1} = 5a_n + 3n - 1$ where $a_1 = -2$ Find: Sum of first 5 terms $S_5 = -702$

III. Use recursive sequences or iterative functions to complete each word problem.

14.) The Cruz family is taking out a mortgage loan for \$100,000 to buy a house. Their monthly payment is \$678.79. The formula: $a_n = (1.006 \cdot a_{n-1}) - 678.79$ describes the balance left on the loan after n payments. Find the balance of the loan after the fourth payment. $\$99,681.99$	15.) Rita has deposited \$1000 in a bank account. At the end of each year, the bank posts interest to her account in the amount of 5% of the balance. But the bank also takes out a \$10 annual fee. Find the balance in the account after 6 years. $\$1,272.08$	16.) Iterating the function $C(x) = 1.06x$ gives the future cost of an item at a constant 6% inflation rate. Find the cost of a \$2,000 ring in five years. $\$2,676.45$
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