- Start with the term after the one they give you
a_{n-1} means the previous term

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Algebra II

Evaluating Recursive Sequences

1. Find a_4 of the sequence $a_n = 2a_{n-1} + 3$ where $a_1 = 1$.

$a_2 = 2(1)+3$ $a_3 = 2(5)+3$ $a_4 = 2(13)+3$
$a_2 = 5$ $a_3 = 13$ $a_4 = 29$

2. Find a_5 of the sequence $a_n = 4a_{n-1} - 2$ where $a_2 = -3$.

$a_3 = 4(-3)-2$ $a_4 = 4(-14)-2$ $a_5 = 4(-58)-2$
$a_3 = -14$ $a_4 = -58$ $a_5 = -234$

3. Find a_7 sequence $a_4 = -2$, $a_n = -3a_{n-1} + 4$

$a_5 = -3(-2)+4$ $a_6 = -3(10)+4$ $a_7 = -3(-26)+4$
$a_5 = 10$ $a_6 = -26$ $a_7 = 82$

4. If $a_n = \frac{a_{n-1}}{2} + 2$ and $a_2 = 16$, find a_5

$a_3 = \frac{16}{2}+2$ $a_4 = \frac{10}{2}+2$ $a_5 = \frac{7}{2}+2$
$a_3 = 10$ $a_4 = 7$ $a_5 = 5.5$

5. If $a_n = (a_{n-1})^2 - 4$ and $a_4 = 2$, find a_7

$a_5 = (2)^2-4$ $a_6 = (0)^2-4$ $a_7 = (-4)^2-4$
$a_5 = 0$ $a_6 = -4$ $a_7 = 12$

n is the term you're finding

6. Find the first four terms of the recursive sequence defined below.

$a_1 = -3$

$a_n = a_{(n-1)} - n$

$a_2 = -3 - 2$ $a_3 = -5 - 3$ $a_4 = -8 - 4$

$a_2 = -5$ $a_3 = -8$ $a_4 = -12$

7. Find the 8th term for the sequence where $a_n = 5a_{n-1} + 2n$ where $a_5 = 3$

$a_6 = 5(3) + 2(6)$ $a_7 = 5(27) + 2(7)$ $a_8 = 5(149) + 2(8)$

$a_6 = 27$ $a_7 = 149$ $a_8 = 761$

8. A sequence is defined recursively by $a_1 = 16$ and $a_n = a_{n-1} - 4n$. Find a_4

$a_2 = 16 - 4(2)$ $a_3 = 8 - 4(3)$ $a_4 = -4 - 4(4)$

$a_2 = 8$ $a_3 = -4$ $a_4 = -20$

9. The recursive formula to describe a sequence is shown below.
State the first four terms of this sequence. Can this sequence be represented using an explicit geometric formula? Justify your answer.

$a_1 = 3$

$a_n = 1 + 2a_{n-1}$

$a_2 = 1 + 2(3)$ $a_3 = 1 + 2(7)$ $a_4 = 1 + 2(15)$ No, there's addition

$a_2 = 1 + 6$ $a_3 = 15$ $a_4 = 31$

$a_2 = 7$

10. What is the fourth term of the sequence defined by $a_1 = 3xy^5$

$a_n = \left(\frac{2x}{y}\right)a_{n-1}$?

1) $12x^3y^3$
2) $24x^2y^4$
3) $24x^4y^2$
4) $48x^5y$

$a_2 = \left(\frac{2x}{y}\right)(3xy^5)$ $a_3 = \left(\frac{2x}{y}\right)(6x^2y^4)$ $a_4 = \left(\frac{2x}{y}\right)(12x^3y^3)$

$a_2 = 6x^2y^4$ $a_3 = 12x^3y^3$ $a_4 = 24x^4y^2$