

13.2 Recursive Definitions

Recursive Formula - Always uses the preceding term to define the next term of the sequence.

★ 1) Always includes an initial condition that tells where to start.

2) Includes a recursion formula.

Ex: $t_1 = 19$ $t_n = t_{n-1} - 5$

$$\begin{array}{l} t_1 = 19 \\ t_2 = t_{2-1} - 5 \\ t_2 = t_1 - 5 \\ t_2 = 19 - 5 \\ t_2 = 14 \end{array} \qquad \begin{array}{l} t_3 = t_{3-1} - 5 \\ t_3 = t_2 - 5 \\ t_3 = 14 - 5 \\ t_3 = 9 \end{array} \qquad t_4 = 4$$

$$19, 14, 9, 4$$

Example) Find the 3rd, 4th, and 5th terms

1) $t_1 = 7$ $t_n = 3t_{n-1} + n$

$$t_3 = 72 \qquad t_4 = 220 \qquad t_5 = 665$$

Rec. Definitions

Find a recursive definition for each of the following.

1) 5, 8, 11, 14, ...

$$t_1 = 5$$
$$t_n = t_{n-1} + 3$$

Always includes an initial condition