

Writing an arithmetic sequence in recursive form.

Vocabulary:

- Term-each number in the sequence
- *Named by its position

Example: 5, 9, 13, 17, 21
Common difference?

$$\begin{aligned}
 t_1 &= 5 \\
 t_2 &= 9 \\
 t_3 &= 13 \\
 t_4 &= 17 \\
 t_5 &= 21
 \end{aligned}$$

+4

So we get 9 by adding 4 to t_1 . Or: $t_2 = t_1 + 4$

We get 13 by adding 4 to t_2 . $t_3 = t_2 + 4$

We get 17 by adding 4 to t_3 . $t_4 = t_3 + 4$

We get 21 by adding 4 to t_4 . $t_5 = t_4 + 4$

Generalization: $t_n = t_{n-1} + 4$

What else do we need before using this as our generalized rule?

First Term

n^{th}
 $t_5 = t_4 + 4$

You have just written the **recursive** form of a **linear** sequence.

*You need a **rule** AND a **first term**

$t_1 = \underline{\quad}$
 $t_n = t_{n-1} + C.D.$

Steps:

1. State the t_1
2. Find the common difference
3. Write $t_n = t_{n-1} + \text{common difference}$

Let's Try...

7, 4, 1, -2, -5

$t_1 = 7$

5, 15, 25, 35, 45

$t_1 = 5$

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

$t_n = t_{n-1} + 10$

Let's go...

Write the first 5 terms of the sequence.

$t_1 = -2$

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

$t_2 = t_2 + 5$
 $t_2 = t_1 + 5$

-2, 3, 8, 13, 18

Write the first 5 terms of the sequence.

$t_1 = 5.4$

$t_n = t_{n-1} + 0.3$

5.4, 5.7, 6.0, 6.3, 6.6

Write the first 5 terms of the sequence.

$$t_1 = 1/4$$

$$\frac{1}{4} - \frac{1}{2} \times 2$$

$$t_n = t_{n-1} + -1/2$$

$$\frac{1}{4} - \frac{2}{4} = -\frac{1}{4}$$

$$\underline{\frac{1}{4}}, \underline{-\frac{1}{4}}, \underline{-\frac{3}{4}}, \underline{-\frac{5}{4}}, \underline{-\frac{7}{4}}$$

$$-\frac{1}{4} - \frac{1}{2} \times 2$$

$$-\frac{1}{4} - \frac{2}{4} = -\frac{3}{4}$$

Find the 7th term of the following sequence:

$$t_1 = -6$$

$$t_n = t_{n-1} + 15$$

$$t_7 = \underline{84}$$

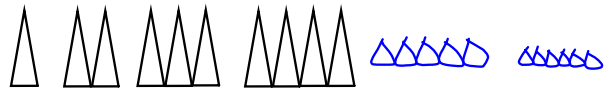
t_1	t_2	t_3	t_4	t_5	t_6	t_7
-6	9	24	39	54	69	84

+15

We can also use picture patterns to write sequences:

Complete the following tasks...

- Draw the next two pictures of the pattern
- Create a table for the first 6 terms
- Write a recursive equation for the sequence

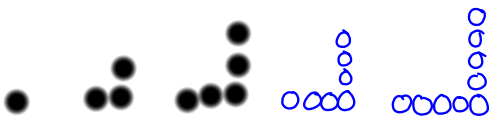


x	t_1	t_2	t_3	t_4	t_5	t_6
y	10	20	30	40	50	60

Recursive Form:

$$t_1 = \Delta$$

$$t_n = t_{n-1} + \Delta$$



x	t_1	t_2	t_3	t_4	t_5	t_6
y	10	30	50	70	90	110

Recursive Form:

$$t_1 = 0$$

$$t_n = t_{n-1} + 00$$

Attachments

Day 1 Homework.pdf