

p. 44-45 **Arithmetic Sequences** 9.2

Find the next numbers in the pattern.

p. 44

Ex 1) 4, 9, 14, 19, 24, 29, 34

(+5)

Ex 2) -8, -2, 4, 10, 16, 22, 28

(+6)

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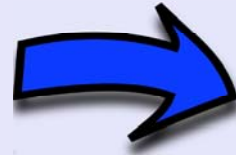
Sequence: ordered list of numbers; each number in a sequence is called a term.

Arithmetic Sequence: a sequence where each term is found by adding a constant to the previous term.

Common Difference: the constant added to get the next term. This can be any real # including positive and negative (fraction, decimal)

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If the first term of the arithmetic sequence is 7 and the common difference equals 3...what is the 279th term?



Do you REALLY want to write out all 279 terms???

Explicit Formula: formula that defines a sequence; used to find any term in a sequence.

Explicit Formula for an Arithmetic Sequence

$$a_n = a_1 + (n - 1)d$$

n^{th} term

first term

Common difference

Example: If the first term of an arithmetic sequence is 7, and the common difference is 3, what is the 279th term?

$$\begin{aligned} a_{279} &= 7 + (279 - 1) \cdot (3) \\ &= 841 \end{aligned}$$

Write an explicit formula for nth term of the arithmetic sequence
Then find a_{25} (The 25th term)

p. 44

1.) $a_1 = 50$ **Common Difference = 5**

$$a_n = 50 + (n-1)(5)$$

$$\begin{aligned} a_{25} &= 50 + (25-1)(5) \\ &= 170 \end{aligned}$$

2.) $a_1 = 11$ **Common Difference = -6**

$$a_n = 11 + (n-1)(-6)$$

$$\begin{aligned} a_{25} &= 11 + (25-1)(-6) \\ &= -133 \end{aligned}$$

Write an explicit formula for the nth term of the arithmetic sequence.
Then find a_{37} (The 37th term).

3.) a_1 10, -12, -34, -56, -78, ... $d = -22$

$$a_n = 10 + (n-1)(-22)$$

$$\begin{aligned} a_{37} &= 10 + (37-1)(-22) \\ &= -782 \end{aligned}$$

4.) a_1 11, 12.1, 13.2, 14.3, 15.4, ... $d = 1.1$

$$a_n = 11 + (n-1)(1.1)$$

$$\begin{aligned} a_{37} &= 11 + (37-1)(1.1) \\ &= 50.6 \end{aligned}$$

Practice!