



Objective: Arithmetic and Geometric Sequences

Homework FN7 – NYA p.463 #1 – 17 (odd), 19, 25, 26, 35

Do Now: Write the function rule

1. $y =$

2. $y =$

1.


x	y
-5	-14
0	1
5	16
10	31

2.

x	y
6	10
8	11
10	12
12	13

Exam Prep: What is the next number in the sequence: 1, 1, 2, 3, 5, 8, 13... ?

- a) 18 b) 21 c) 26 d) It is not a sequence

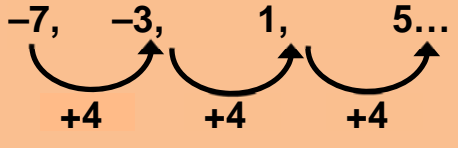
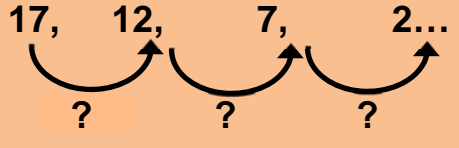
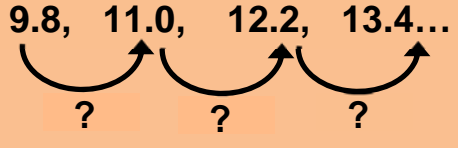


More work with patterns!! The Doctor casts shame to anyone who does not try in these lessons. See guidance from Big Bird.

Arithmetic Sequences

A set of numbers that form a pattern is called a sequence. In arithmetic sequences, there is a constant common difference between terms.

Finding the Common Difference

$-7, -3, 1, 5\dots$ 	$17, 12, 7, 2\dots$ 	$9.8, 11.0, 12.2, 13.4\dots$ 
Common Difference: +4	Common Difference:	Common Difference:

Write the next two terms:

1. 5, -2, -9, -16...	2. 11, 24, 37, 40...
3. 8, 6, 4, 2...	4. 19, 19, 19, 19...

Rule for Arithmetic Sequences

$$A(n) = a + (n - 1)d$$

n th term \uparrow
First term \uparrow
Term number \uparrow
Common Difference \uparrow

Example: $A(n) = 7 + (n - 1)4$

First term: $A(1) = 7 + (1 - 1)4 = 7$

Second term: $A(2) = 7 + (2 - 1)4 = 11$

Fifth term: $A(5) = 7 + (5 - 1)4 = 23$

Tenth term: $A(10) = 7 + (10 - 1)4 = 43$

Practice

Find the 8th term.

1. 10, 15, 20, 25...

Find the 12th term.

2. 2, 5, 8, 11...

Find the 20th term.

3. 6, 15, 24, 33...

Find the 25th term.

4. -12, -14, -16, -18...

Geometric Sequences

In geometric sequences, there is a constant common ratio between terms.

2, 10, 50, 250...

\curvearrowright $\times 5$ \curvearrowright $\times 5$ \curvearrowright $\times 5$

Here the common ratio is 5.

Practice: Find the common ratio of each sequence.

1. 2, -6, 18, -54...

2. 56, 28, 14, 7...

3. 4, 20, 100, 500...

4. 1000, 100, 10, 1...

Write the next two terms:

1. -2, 6, -18, 54...

2. 5, 20, 80, 320...

3. 8, 8, 8, 8...

4. 200, 100, 50, 25...

Rule for Geometric Sequences

$$A(n) = a \cdot r^{n-1}$$

n th term
First term
Common ratio
Term number

Example: $A(n) = 5(-2)^{n-1}$

First term: $A(1) = 5(-2)^{1-1} = 5$

Fifth term: $A(5) = 5(-2)^{5-1} = 5(-2)^4 = 80$

Tenth term: $A(10) = 5(-2)^{10-1} = 5(-2)^9 = -2560$

Practice

Find the 6th term.

1. 10, 20, 40...

Find the 75th term.

2. -3, 3, -3, 3...

Find the 12th term.

3. 600, 60, 6, 0.6...

Find the 8th term.

4. 20, 10, 5, 2.5...