Bell Ringer

Thursday 10/3

1-4. Determine whether each sequence is an arithmetic sequence or not. If so, find the common difference and write the next three terms of the sequence.

1. 13, 26, 39, 52,…
2. 5, 9, 14, 20,…
3. 48, 24, 12, 6,…
4. 87, 81, 75, 69,…

d = 13
65, 78, 91

d =
Not
Arith

Not

d = -6
63, 57, 51

5-6. Write an equation for the nth term of the arithmetic sequence, then find a_{12}.

5. -6, -9, -12, -15,…
6. 100, 110, 120, 130,…

$a_n = -6 + (n-1)(-3)$

$a_{12} = -6 + (12-1)(-3)$

$-6 + (-33) = -39$

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

$a_n = 100 + (n-1)(10)$

$a_{12} = 100 + (12-1)(10)$

$100 + 110$

$= 210$

4.5 online hw due today!

4.6 online hw due tomorrow!

Yesterday...

Arithmetic Sequence: A sequence where the difference between consecutive terms is constant.

Common Difference: The difference between each term in an arithmetic sequence

Tell whether the sequence is arithmetic. If it is, what is the common difference?

3, 8, 13, 18, ...

+5 +5

-5, -9, -13, -17, ...

$d = -4$

-5, -10, -20, -40, ...

!!

-2, 1, 4, 7, ... $d = 3$

Remember...

Core Concept

Equation for an Arithmetic Sequence

Let a_n be the nth term of an arithmetic sequence with first term a_1 and common difference d. The nth term is given by

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

1, 4, 7, 10, ...

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

$a_1 = 1$

$a_2 = 1 + 3$ 1x

$a_3 = 1 + 3 + 3$ 2x

$a_4 = 1 + 3 + 3 + 3$ 3x

17^{th}

$1 + 3(16)$

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

$a_3 + (n-3)d$

Write an equation for the *n*th term of the arithmetic sequence

15, 7, -1, -9, ... Then find a_{17}.

n: 1 2 3 4

a_n: 15, 7, -1, -9

$d = -8$

$a_1 = 15$

$a_n = 15 + (n-1)(-8)$

$a_{17} = 15 + (17-1)(-8)$

$15 - 128 = -113$

-113

n

Write an equation for the *n*th term of the arithmetic sequence

5, 11, 17, 23, ... Then find a_{24}.

Online bidding for a purse increases by $5 for each bid after the $60 initial bid.

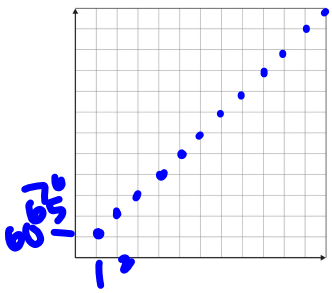
Bid Number	1	2	3	4
Bid Amount	$60	$65	$70	$75

a. Write a function that represents the arithmetic sequence.

$a_n = 60 + 5(n-1)$

$60+(n-1)(5)$

b. Graph the function.



c. The winning bid is $105. How many bids were there?

$105 = 60 + 5(n-1)$

$60 + 5n - 5$

$105 = 55 + 5n$

$-55 \quad -55$

$\frac{50}{5} = \frac{5n}{5}$ $n = 10$

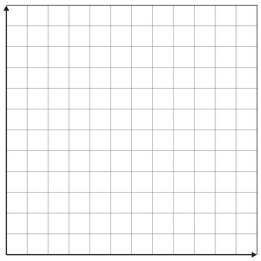
$a_n = 105$

A carnival charges $2 for each game after you pay a $5 entry fee.

Games	1	2	3	4
Total Cost	$7	$9	$11	$13

a. Write a function that represents the arithmetic sequence.

b. Graph the function.



c. How many games can you play when you take $29 to the carnival?

You can write an arithmetic sequence using a **recursive formula**...

A recursive formula is a function rule that relates each term of a sequence after the first to the ones before it.

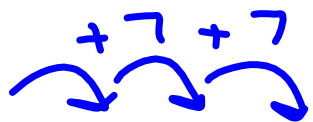
$a_1 =$ ____ , $a_n = a_{n-1} + d$

Ex: 7, 11, 15, 19, ... $d = 4$

$a_1 = 7,\ a_n = a_{n-1} + 4$

$a_{50} = a_{49} + 4$ ...

Write a recursive formula for the arithmetic sequence.
Find a_8



70, 77, 84, 91, ... $a_1 =$ 70, $a_n = a_{n-1} + d$

98, 105, 112, 119

$a_n = a_{n-1} + 7$

$a_8 = a_{8-1} + 7$

$a_8 = a_7 + 7$

Write the explicit formula for the arithmetic sequence. Find a_8

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

$a_n = 70 + (n-1)(7)$

$a_8 = 70 + 49 = 119$

Write a recursive formula for each arithmetic.
Find the 8th term of each sequence

a. 3, 9, 15, 21, ...

$a_1 = 3, \quad a_n = a_{n-1} + 6$

b. 23, 35, 47, 59, ...

c. 7.3, 7.8, 8.3, 8.8, ...

$a_1 = 7.3, \quad a_n = a_{n-1} + 0.5$

d. 97, 88, 79, 70, ...

State the first four terms in each sequence

a. $a_1 = 4$, $a_n = a_{n-1} + 5$ (+d)

4, 9, 14, 19

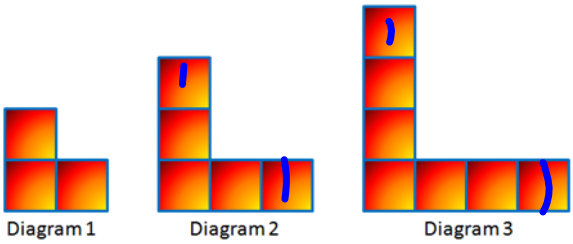
b. $a_1 = 1$, $a_n = a_{n-1} - 1/2$

$1, \frac{1}{2}, 0, -\frac{1}{2}$

c. $a_1 = -15$, $a_n = a_{n-1} - 10$

$-15, -25, -35, -45, \ldots$

Write a recursive and explicit formula for the arithmetic sequence



R: $a_1 = 3,\ a_n = a_{n-1} + 2$

E: $a_n = 3 + (n-1)(2)$

Write a recursive and explicit formula for the arithmetic sequence

n	a_n
1	15
2	17
3	19
...	
10	
100	
150	

Name _____ Date _____ Hour _____ Score

4.6 Day 2 - Arithmetic Sequences Practice ws

Write the recursive and explicit formulas for each arithmetic sequence. Use your equation to complete the table!

6, 7, 8, ...

1)

n	a_n
1	6
2	7
3	8
...	...
10	15
100	105
150	155

2)

1	7
2	11
3	15
...	...
10	
100	
150	

3)

2	7
3	11
4	15
...	...
10	
100	
150	

3, 7, 11, 15, ...

+4 +4

R: $a_1 = 6, a_n = a_{n-1} + 1$

E: $a_n = 6 + (n-1)(1)$

R: $a_1 = 3, a_n = a_{n-1} + 4$

E: $a_n = 3 + (n-1)(4)$

4)

1	0
2	1
3	2
4	3
5	4
6	5
...	...
10	
100	
150	149

$0 + (n-1)(1)$

0, 1, 2, 3, 4

5)

1	3
2	6
3	9
...	...
10	
100	
150	

6)

1	8
2	13
3	18
...	...
10	
100	
150	

7)

3	11
4	16
5	21
...	...
10	
100	
150	

8)

1	8
2	12
3	16
...	...
10	
100	
150	

9)

2	3
3	5
4	7
...	...
10	
100	
150	

Write the recursive and explicit formulas for each arithmetic sequence.

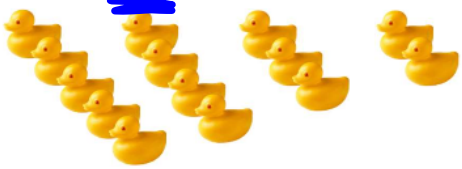
y represents the number of boxes at each step "x"

10) x = 1 x = 2 x = 3 x = 4

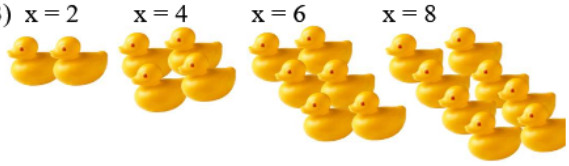
11) x = 0 x = 1 x = 2 x = 3

y represents the number of ducks in each row "x"

12) x = 0 x = 1 x = 2 x = 3



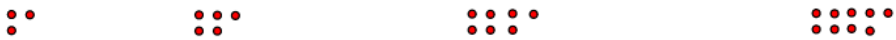
13) x = 2 x = 4 x = 6 x = 8



y represents the number of dots at each step "x"

14) x = 1 x = 2 x = 3 x = 4

15) x = 0 x = 1 x = 2 x = 3



16) x = 3 x = 6 x = 9 x = 12