## Writing the Recursive Form From Sequences and Pictures

Find the next two numbers in the pattern:

9, 7, 5, 3, __1__ , __-1__

Describe the pattern:

_- 2_

Turn the pattern into a chart:

| x | y |
|---|---|
| 1 | 9 |
| 2 | 7 |
| 3 | 5 |
| 4 | 3 |
| 5 | 1 |
| 6 | -1 |

We did describe patterns by...

1) Lists
2) Charts
3) Graphs

Now we are going to describe patterns by...

_Next-Now Statement_

Describe these patterns using "next-now" statements.

Now Next  Now Next
-2, 3, 8, 13     __Next = Now + 5__

Now Next
1, -1, 1, -1     __Next = Now (-1)__

Next
Now Next
20, 15, 10, 5     __Next = Now - 5__

3, 6, 9, 12     __Next = Now + 3__

Identifying an arithmetic sequence

-5, -8, -11, -14, __-17__ , __-20__   1   next = now + -3 __now - 3__

4, -8, 16, -32, __64__ , __-128__   2   next = __now (-2)__

6, 11, 16, 21, __26__ , __31__   3   next = __now + 5__

1, 3, 9, 27, __81__ , __243__   4   next = __now (3)__

How are patterns 1 and 3 alike?

_You're Adding_

Sequences that fit this type of pattern are called **arithmetic**. In an arithmetic sequence the difference between a term and the term before it is always the same. This is called the **common difference**.

Patterns 2 and 4 are not arithmetic because the same number is not being added to move along the sequence.

Determine if the sequences listed are arithmetic. If they are, find the common difference.

+3 +4 +5 +6
1) 3, 6, 10 15, 21

NO

-2 -2 -2 -2
2) 11, 9, 7, 5, 3

Yes , -2

+1/2 +1/2 +1/2 +1/2
3) 1, 3/2, 2, 5/2, 3
1½   2½

Yes , + 1/2

×2 ×2 ×2 ×2
4) 3, 6, 12, 24, 48

NO

# Attachments

Day 1 Homework.pdf