The following sequences are **arithmetic**:

    a.   1, 5, 9, 13, 17, …   b.   4, 7, 10, 13, 16, …

    c.   10, 6, 2, -2, -6, …   d. $a_1,\ a_1 + d,\ a_1 + 2d,\ a_1 + 3d, \ldots$

1. List the next three terms of each sequence above and explain what you did to get those terms.

    a.   b.

    c.   d.

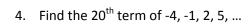2. In your own words, define what an arithmetic sequence is.

3. Determine a general formula for each sequence that will allow you to find **any** term (even the 500th term) without listing them all out. In other words, if you want to find the 500th term, you should be able to plug in 500 for your variable and get the answer. Try your idea(s) on the terms listed and make sure it works. Please define any variables you have in your formulas!

    a.   b.

    c.   d.

    (Your answer to 3d should be the general formula for finding any term of an arithmetic sequence.)

4. Find the 20th term of -4, -1, 2, 5, …

5. Find the 36th term of a sequence that has $a_1 = 3$ and d = -2.

6. Find n for the sequence that has $a_n = 352$, $a_1 = 8$, and d = 4.

7. Find d for the sequence that has $a_1 = 30$ and $a_{11} = -10$

8. Find the 10th term of an arithmetic sequence that has $a_{12} = 37$ and $a_{21} = 64$