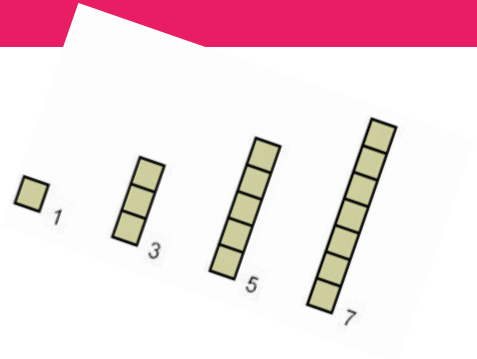
Lesson 4 :

Using Technology to Work with Sequences

Learning Targets:

- I can use a spreadsheet to create many terms of a sequence.
- I can use technology to graph a sequence.

Let's use technology to create a sequence.



4.1 Where Does It Live?

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Open a blank spreadsheet

Type the following in each cell:

In A1, type 2

In A2, type 3

In A3, type -10

In A4, type 1/5

In B1, type =A1+A2

In B2, type =A3*A4

In B3, type =B1+333

In B4, type =abs(B2)

4.1 Where Does It Live?

1. Look at the numbers that appear in B1, B2, B3, and B4 after you press enter.
    Where did these numbers come from?

2. Experiment with typing some different values in A1, A2, A3, and A4.
    Describe what happens.

3. Experiment with typing some new formulas in some new cells.
    a. Can you figure out how to raise a number to a power?

    b. What happens if you forget to start a formula with the = symbol?

4.2 Fill Down

1. Open a blank spreadsheet. In A1, type 10 and enter.

   a. In A2, type =A1+3 and enter.

   b. Click once on cell A2 to highlight it. See the little + in the lower-right corner? Click and drag it down to highlight several rows in that column and then let go. (This is known as "fill down.") Describe what happens.

   c. What simple thing can you edit so that column A shows the sequence 12, 15, 18, . . .?

   d. What simple things can you edit so that column A shows the sequence 12, 11, 10, . . .?

4.2 Fill Down

2. In B1, type 16 and enter.

   a. In B2, type =B1*0.5 and enter.

   b. Click on cell B2 and fill down. Describe what happens.

   c. What simple thing can you edit so that column B shows the sequence 10, 5, 2.5, . . .?

   d. What simple things can you edit so that column B shows the sequence 10, 30, 90, . . .?

4.2 Fill Down

3. In column C, starting at C1 and going down, type these terms of a geometric sequence: 700, 70, 7, 0.7, 0.07

   a. In cell D2, type =C2/C1. What is the result?

   b. What is the meaning of the result?

   c. Click on cell D2 and fill down. What happens?

4.2 Fill Down

4. In column E, starting at E1 and going down, type these terms of an arithmetic sequence: 7, 10.5, 14, 17.5

    a. In cell F2, type =E2-E1. What is the result?

    b. What is the meaning of the result?

    c. Click on cell F2 and fill down. What happens?

4.2 Fill Down

5.

Use the spreadsheet to decide whether the sequence 8, 12, 18, 27, 40.5 is arithmetic or geometric, and find its rate of change or growth factor.

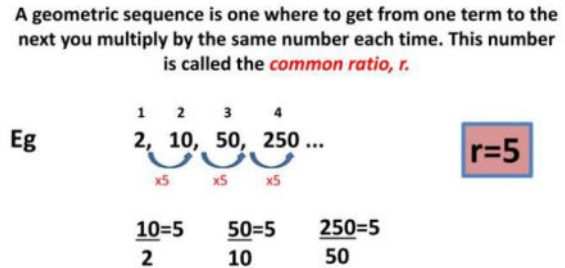
6.

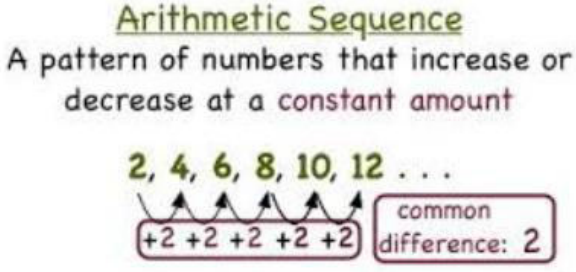
Use the spreadsheet to decide whether the sequence 50, 42.1, 34.2, 26.3 is arithmetic or geometric, and find its rate of change or growth factor.

Activity Synthesis

How did you use the spreadsheet to identify the type of sequence?

How did you use the spreadsheet to find the rate of change/growth factor of the sequence?





4.3 Plot Some Points

Quiet Work Time

Complete the following tasks.

1. Open a graphing utility and follow your teacher's instructions to create a new table with 2 columns. Learn how the 2 numbers in each row can be plotted as points in the coordinate plane.

   a. Change the numbers in the table so that all of the plotted points lie along a diagonal line with a positive slope.
   b. Change the numbers in the table so that all of the plotted points lie along a horizontal line.
   c. Change the numbers in the table so that the graph created does *not* represent a function.

2. Follow your teacher's instructions to make one column a function of the other.

   a. Change the expression in the second column so that the plotted points lie on a line with a different steepness.
   b. Change the expression in the second column so that the plotted points do not lie on a line.
   c. Change the table so that some of the points are plotted in the second quadrant of the graph (the upper-left quadrant).

Lesson Synthesis:

How do you create a table of values using technology?

What are some advantages of using technology to find a rule for a sequence and extend the number of its terms?

When do you think it is appropriate to use technology to represent data or to calculate statistics?