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 **Objectives:**

* Find the midpoint between 2 points.
* Find the distance between 2 points.
* Identify an arithmetic sequence.
* Give the common difference of an arithmetic sequence.
* Find the nth term of an arithmetic sequence.
* Find arithmetic means between 2 terms of an arithmetic sequence.
* Identify a geometric sequence.
* Give the common ratio of a geometric sequence.
* Find the nth term of a geometric sequence.
* Find geometric means between 2 terms of a geometric sequence.

***MONDAY (12.2.24****)*

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| **Class Work:****Arithmetic sequences** follow a pattern of **adding a fixed amount from one term to the next**. The fixed amount is called the **common difference, *d.*** To find the common difference, subtract the first term from the second term. To **find any term**of an **arithmetic sequence**:***arformula1***where *a*1 is the first term of the sequence,*d*is the common difference,*n*is the number of the term to find.1. Find the common difference for this arithmetic sequence: 4, 15, 26, 37, … .

Write the next 3 terms.Find the 10th term.1. Find the common difference for the arithmetic sequence whose formula is an = 6n + 3.

Write the first 5 terms.Find the 200th term.1. Find the 20th term of the sequence, 3, 5, 7, 9, 11, … .
2. ***Arithmetic Means*** are terms between 2 given terms of an arithmetic sequence. Insert 3 arithmetic means between 7 and 23.

**Geometric sequences** follow a pattern of **multiplying a fixed amount (not zero) from one term to the next**. The fixed amount is called the **common ratio, *r*,**referring to the fact that the ratio (fraction) of second term to the first term yields the common multiple. To find the common ratio, divide the second term by the first term.To **find any term** of a **geometric sequence**:***geoformula1***where *a*1 is the first term of the sequence,*r*is the common ratio,*n*is the number of the term to find.1. Find **the common ratio** of the sequence, 2, 6, 18, 54, … .

Write the next 3 terms.Find the 7th term.1. Find the 11th term of the sequence, 1, ½, ¼, … .
2. ***Geometric Means*** are terms between 2 given terms of a geometric sequence. Insert 3 geometric means between 4 and 324.

**Class Work/Homework:** Sequences Worksheet to be received in class. |

***WEDNESDAY (12.4.24****)*

**Class Work Check:** Sequences Worksheet

**Discuss the solutions for the Sequences Worksheet.**

**Sum Formula for the first n terms of an arithmetic sequence = n(a1 + an)**

 **2**

**The sum of the first n terms of an arithmetic sequence is called an arithmetic series.**

**Class Work/Homework: ACT Sequence Problems:**

1. Andrea is selling boxes of cookies door-to-door. On her first day, she sells 12 boxes of cookies, and she intends to sell 5 more boxes per day than on the day previous. If she meets her goal and sells boxes of cookies for a total of 10 days, how many boxes total did she sell?
2. 314
3. 345
4. 415
5. 474
6. 505
7. What is the sum of the first 5 terms of an arithmetic sequence in which the 6th term is 14 and the 11th term is 22?
8. 2.2
9. 6.0
10. 12.4
11. 32.6
12. 46.0

***FRIDAY (12.6.24****)*

**Previous Class Work/Homework Check**

To find the sum of the first n terms of a geometric sequence, Sn, use the formula
**Sn=a1(1−rn)**

 **1−r ,**

**r≠1,**
where n is the number of terms, a1 is the first term and r is the [common ratio](https://www.varsitytutors.com/hotmath/hotmath_help/topics/common-ratio).

The sum of the first n terms of a geometric sequence is called a **geometric series**.

To find the sum of an infinite geometric sequence, use **S = a1\_\_ .**

 **1 – r , where r is between, but nor equal to, -1 and 1.**

* 1. Find the sum of the first 8 terms of the geometric series if a1=1 and r=2.
	2. Find the sum of the first 10 terms of the geometric sequence 24,12,6,⋯.
	3. Find the sum of the infinite geometric sequence
	27,18,12,8,⋯.
	4. Find the sum of the infinite geometric sequence
	8,12,18,27,⋯ if it exists.