

Sequences & Series Unit Homework

Directions 1-4: Determine whether the following sequences are arithmetic, geometric, or neither. If it is arithmetic, find the common difference. If it is geometric, find the common ratio.

1. 40, 20, 10, 5...

2. 2, -4, 8, -16, 32...

3. 1, 2, 3, 4, 5...

4. 1, 1, 2, 3, 5, 8, 13...

5. Find the sum of the first 100 positive multiples of 5.

6. Find the first five terms of the geometric sequences if $a_1 = 9$ and $a_3 = 4$.

7. Simplify the factorial $\frac{513!}{510!}$

8. Find the sum $\sum_{i=1}^5 (3)^{i-1}$.

9. Use sigma (summation) notation to write the sum: $10+15+20+25$

10. Find the sum of the first 120 terms of the arithmetic sequences with the given characteristics. $a_1 = 12$ and $d = 3$.

11. Find the n th term of the geometric sequence. Then find the sum of the first 20 terms. Round to 3 decimal places. $a_1 = 16$ and $a_2 = -8$

Directions 1-4: Determine whether the following sequences are arithmetic or not. If it is arithmetic, find the common difference.

1. 5, -2, -9, -16...

2. $\frac{1}{2}$, 4, $\frac{15}{2}$, 11...

3. 1, 4, 9, 16...

4. 29, 25, 21, 17, 13, 9

5. What is the value of the first term in the arithmetic sequences if $a_6 = 87$ and $a_{12} = 129$?

6. Write the first five terms of the sequence $a_n = \frac{(-1)^n}{(2n+1)!}$.

7. Write the first five terms of the sequence defined recursively $a_1 = 9$
 $a_{k+1} = a_k - 4$.

8. Simplify the factorial expression $\frac{(2n-1)!}{(2n+1)!}$

9. Find the partial sum $\sum_{n=3}^{80} 5n$

10. Given the series $-12+2+16+\dots+506$, determine how many terms are being added; then find the sum.

11. Write the formula for the n th term of the arithmetic sequence if $a_4 = -10$ and $a_{10} = -25$.