1. What is the common ratio in \( \frac{1}{5}, \frac{2}{25}, \frac{4}{125}, \ldots \)?
   \[ \frac{2}{25}, \frac{4}{125} \]
   \( \frac{2}{5} \)
   1. \( \frac{2}{5} \)

2. What is the common difference in \(-2, -5, -8, -11, \ldots\) ?
   \( -3, -3 \)
   2. \(-3\)

3. What type of sequence/series does the following represent?
   \[ \sum_{n=1}^{10} (3n-2) \]
   \( 1, 4, 7, \ldots \)
   \( r = \frac{1}{3} \)
   3. arithmetic, finite

4. What type of sequence does the following represent?
   a. \(2, -6, 18, -54, 162, \ldots \)
   \( -3, -3 \)
   4a. geo

   b. \(1, 2, 6, 24, 120, \ldots \)
   \( 2, 3, 4 \)
   4b. none

   c. \(1, 4, 7, 10, \ldots \)
   \( +3 \)
   4c. arith

5. Insert 3 arithmetic means between 14 and 46.
   \( 14, 22, 30, 38, 46 \)
   \( 22, 30, 38 \)
   5. \( 22, 30, 38 \)

6. Insert one geometric mean between \( \sqrt{2} \) and \( \sqrt{50} \).
   \( \sqrt{25} = 5 \)
   \( \sqrt{\frac{25}{2}} = \sqrt{\frac{10}{2}} = \sqrt{5} \)
   \( 2 \sqrt{5} = \sqrt{5} \)
   6. \( \sqrt{10} \)

7. Write the formula for the nth term in \( \frac{3}{1}, \frac{3}{2}, \frac{3}{4}, \ldots \).
   \( a_n = a_1 \cdot r^{(n-1)} \)
   \( r = \frac{1}{2} \)
   \( a_n = 3 \cdot \left( \frac{1}{2} \right)^{(n-1)} \)
   7. \( a_n = 3 \cdot \left( \frac{1}{2} \right)^{(n-1)} \)
8. Write the formula for the nth term in 1, 5, 9, 13, ...
\[ a_n = a_1 + d(n-1) \]
\[ a_n = 1 + 4(n-1) \]
\[ a_n = 4n - 3 \]
\[ \sum_{n=1}^{27} 3n + 2 \]
9. 27

10. What are the three geometric means between 5 and 80
\[ \sqrt[2]{5, 10, 20, 40, 80} \]
11. What is the 12th term for 1, -4, 16, -64, ...
\[ a_n = a_1 \cdot r^{(n-1)} \]
\[ a_n = 1 \cdot (-4)^{(n-1)} \]
12. What is the 42nd term of 8, 6, 4, ...
\[ a_n = a_1 + d(n-1) \]
\[ a_n = 8 + 2(42-1) \]
\[ a_n = 8 + 82 \]
\[ a_n = 90 \]
13. Find the position of 222 in the sequence 2, 7, 12, 17, ...
\[ a_n = a_1 + d(n-1) \]
\[ 222 = 2 + 5(n-1) \]
\[ 222 = 5n - 3 \]
\[ 222 = \frac{5n}{5} \]
14. Rewrite using sigma notation 4 + 9 + 14 + ... + 124
\[ \sum_{i=1}^{25} 5n - 1 \]
15. Find the sum of 3 + 6 + 9 + ... + 300
\[ S_n = \frac{n(a_1 + a_n)}{2} \]
\[ S_n = \frac{100(3 + 300)}{2} \]
\[ S_n = 15, 150 \]
16. Find the sum of \(2 + (-1) + \frac{1}{2} + (-\frac{1}{4}) + \ldots\)

\[ k = \frac{1}{2}, \quad S_n = \frac{a_1}{1-r} = \frac{\frac{2}{3}}{2} = \frac{2}{3} \times \frac{3}{2} = \frac{1}{3} \]

17. Stanley spent 8 minutes cleaning out his closet on the first day of vacation. For each of the next 7 days, he spent 5 more minutes than he had the day before. Including the first day of vacation, how many total minutes did Stanley spend cleaning out his closet?

\[ a_1 = 8, \quad 13, 18, 23, 28, 33, 38, 43 \quad \sum_{n=1}^{50} n(n+50) = 204 \]

\[ S = \frac{48(8+43)}{2} \quad 4(51) = 204 \]

18. Find the sum of \(\sum_{n=1}^{50} 1, 2, 3, \ldots, 50\)

\[ S_n = \frac{n(a_1+a_n)}{2} = \frac{25}{50(1+50)} = \frac{25(51)}{2} \]

19. Write in Sigma Notation: \(-3 + (-1) + 1 + 3 + \ldots + 23\)

\[ \frac{14}{2} \geq 2n - 5 \quad \sum_{n=1}^{20} (-3 + 2(n-1)) = \frac{14}{2} \cdot \frac{14}{2} \cdot \frac{25}{2} \]

20. What is the sum of the infinite geometric series in which \(a_1 = 12\), and \(r = \frac{1}{2}\)

\[ S_n = \frac{12}{1 - \frac{1}{2}} = \frac{24}{2} = 12 \]

21. Given an arithmetic sequence in which: \(a_6 = 39\), and \(a_{14} = 79\)

\[ a_n = a_1 + d(n-1) \]

\[ 39 = a_1 + d(6-1) \quad 79 = a_1 + d(14-1) \]

\[ a_1 = 14 \quad d = 5 \]

22. Write \(12121212\ldots\) as a fraction reduced to lowest terms

\[ \frac{12}{99} = \frac{4}{33} \]