

1. Write the first three terms and the 100th term of $a_n = 2 + 3(n - 1)$.

2. Find the first four terms of the sequence defined recursively by $a_1 = 1$, $a_2 = 1$, $a_n = a_{n-1} + a_{n-2}$

3. Find the following sum.

$$\sum_{i=1}^5 2$$

4. Find the following sum.

$$\sum_{k=-2}^2 k2^k$$

5. Find a formula for the n th term of the sequence $1, -3, 9, -27, 81, \dots$

6. Find a formula for the n th term of the sequence $10, 6, 2, -2, -6, \dots$

7. Write the sum using sigma notation.

$$\frac{1}{2 \ln 2} - \frac{1}{3 \ln 3} + \frac{1}{4 \ln 4} - \frac{1}{5 \ln 5} + \cdots + \frac{1}{100 \ln 100}$$

Q: What word can you make by adding letters to each side of XYG? (Hint: add one letter to the left side, and two letters to the right side.)

8. Find the first three terms of $a_n = \frac{(-1)^n \cdot 3n}{2^{n-1}}$. Then find the 9th term.

9. Find the first three terms of $a_n = \frac{-3+5(n-1)}{4-3(n-1)}$. Then find the 21st term.

10. Find the first four terms of the sequence defined recursively by $a_1 = -2$, $a_n = 3a_{n-1} + 5$.

11. Find the first four terms of the sequence defined recursively by $a_1 = 0$, $a_n = n \cdot a_{n-1} + 1$.

12. Find the first four partial sums of the sequence $a_n = \left(\frac{2}{3}\right)^{n-1}$.

13. Find the first four partial sums of the sequence $a_n = (-1)^{n+1}(5 + 2n)$.

14. Find the sum.

$$\sum_{k=-1}^5 (3k^2 + 1)$$

15. Find the sum.

$$\sum_{i=2}^6 (7 - 2i)$$

16. Find a formula for the n th term of the sequence $9, -\frac{27}{\sqrt{3}}, \frac{81}{\sqrt{5}}, -\frac{243}{\sqrt{7}}, \dots$

17. Find a formula for the n th term of the sequence $\frac{5}{4}, \frac{2}{9}, -\frac{1}{16}, -\frac{4}{25}, -\frac{7}{36}, \dots$

18. Find a formula for the n th term of the sequence $\frac{1}{8}, -\frac{1}{16}, -\frac{3}{32}, -\frac{5}{64}, \dots$

19. Find a formula for the n th term of the sequence $-8, \frac{27}{5}, -\frac{64}{9}, \frac{125}{13}, -\frac{216}{17}, \dots$

20. Write the sum using sigma notation.

$$-9 - \frac{3}{2} + \frac{3}{4} + \frac{9}{8} + \frac{15}{16} + \frac{21}{32} + \frac{27}{64}$$

21. Write the sum using sigma notation.

$$\frac{1}{2} - \frac{8}{7} + \frac{27}{12} - \frac{64}{17} + \frac{125}{22}$$

22. Write the sum using sigma notation.

$$-\frac{9}{8} + 1 - \frac{25}{32} + \frac{36}{64} - \frac{49}{128}$$

23. Write the sum using sigma notation.

$$1 + \frac{1}{9} - \frac{2}{14} - \frac{5}{19} - \frac{8}{24} - \frac{11}{29}$$

Optional exercises from the Sullivan book if you'd like more practice:
12.1 (p.807) #15-43 odd, 49-65 odd, 69