

Comparing Arithmetic and Geometric Sequences

For each sequence, state if it is arithmetic, geometric, or neither.

1) 1, 3, 6, 10, 15, ...

2) 40, 43, 46, 49, 52, ...

3) $4, \frac{13}{3}, \frac{14}{3}, 5, \frac{16}{3}, \dots$

4) -4, 12, -36, 108, -324, ...

5) 4, 16, 36, 64, 100, ...

6) -29, -34, -39, -44, -49, ...

7) 1, 5, 25, 125, 625, ...

8) 1, 4, 9, 16, 25, ...

9) -34, -26, -18, -10, -2, ...

10) 0, 3, 8, 15, 24, ...

11) $a_n = -163 + 200n$

12) $a_n = 16 + 3n$

13) $a_n = -4 \cdot (-3)^{n-1}$

14) $a_n = -\frac{3}{4} + \frac{3}{2}n$

15) $a_n = -43 + 4n$

16) $a_n = (2n)^2$

17) $a_n = -43 + 7n$

18) $a_n = \frac{n}{2^n}$

19) $a_n = -(-3)^{n-1}$

20) $a_n = 2 \cdot (-3)^{n-1}$

21) $a_n = a_{n-1} + 6$
 $a_1 = -17$

22) $a_n = na_{n-1}$
 $a_1 = -1$

23) $a_n = a_{n-1} \cdot -5$
 $a_1 = 4$

24) $a_n = a_{n-1} + 8$
 $a_1 = -17$

25) $a_n = \frac{2 + a_{n-1}}{2}$
 $a_1 = -6$

26) $a_n = a_{n-1} + 2$
 $a_1 = 9$

27) $a_n = a_{n-1} + 10$
 $a_1 = -1$

28) $a_n = na_{n-1}$
 $a_1 = 1$

29) $a_n = a_{n-1} \cdot \frac{1}{2}$
 $a_1 = 8$

30) $a_n = \frac{2 + a_{n-1}}{2}$
 $a_1 = -14$

Introduction to Series

Rewrite each series as a sum.

1) $\sum_{m=1}^5 (4m^2 + 4)$

2) $\sum_{k=1}^5 (30 - k^2)$

3) $\sum_{n=1}^5 n$

4) $\sum_{m=1}^6 (50 - m)$

5) $\sum_{a=1}^6 (3a^2 - 2)$

6) $\sum_{m=1}^5 (100 - m)$

7) $\sum_{m=1}^4 (5m^2 + 4)$

8) $\sum_{a=4}^9 (20 - a^2)$

9) $\sum_{m=1}^6 \frac{m^2 + 1}{m}$

10) $\sum_{n=4}^9 (100 - n)$

11) $\sum_{m=0}^5 m(m + 2)$

12) $\sum_{k=0}^4 (100 - k)$

Evaluate each series.

13) $\sum_{n=1}^7 (40 - n^2)$

14) $\sum_{k=1}^5 3k$

15) $\sum_{a=1}^7 (500 - a)$

16) $\sum_{k=1}^7 (30 - k)$

17) $\sum_{a=0}^5 a$

18) $\sum_{k=0}^4 2k$

19) $\sum_{k=1}^6 k^2$

20) $\sum_{m=1}^5 3m$

Rewrite each series using sigma notation.

21) $1 + 2 + 3 + 4$

22) $3 + 9 + 27 + 81 + 243$

23) $3 + 9 + 27 + 81$

24) $1 + 4 + 9 + 16 + 25$

25) $4 + 8 + 12 + 16$

26) $2 + 4 + 6 + 8 + 10$

27) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}$

28) $5 + \frac{5}{2} + \frac{5}{3} + \frac{5}{4} + 1$

29) $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}$

30) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6} + \frac{6}{7}$

Critical thinking questions:

31) Are these equal? Why or why not?

$$\sum_{x=1}^{50} \frac{1}{x} \quad \text{and} \quad \sum_{x=21}^{70} \frac{1}{x-20}$$

32) Rewrite the following so that it starts at $x = 0$

$$\sum_{x=7}^{10} x(x+1)$$