

**SHOW ALL WORK.**

Complete Parts A & B OR Parts B & C

**PART A:**

**Determine whether the given sequence is Arithmetic, Geometric, or Neither. Explain why.**

1. 5, 14, 23, 32, 41, ...                      2. 16, 14, 11, 6, 3, ...                      3. 216, 36, 6, 1,  $\frac{1}{6}$ , ...
4. 4, 16, 64, 256, 1024, ...                      5. 1, -2, -5, -8, -11, ...                      6. 1, 4, 8, 16, 32, ...

**Write a rule for the nth term of the sequence. Then find  $a_{20}$ .**

7. 1, 4, 7, 10, 13, ...                      8. 5, 11, 17, 23, 29, ...                      9. 8, 21, 34, 47, 60, ...

**Write a rule for the nth term of the sequence. Then find  $a_7$ .**

10. 1, -4, 16, -64, ...                      11. 6, 18, 54, 162, ...                      12. 4, 24, 144, 864, ...

**PART B:**

Determine whether the given sequence is Arithmetic, Geometric, or Neither. Explain why.

13.  $-10, -7, -5, -2, 0, \dots$

14.  $0.5, 1, 1.5, 2, 2.5, \dots$

15.  $20, 10, 5, 2.5, 1.25, \dots$

16.  $\frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{8}{3}, \dots$

17.  $\frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, \dots$

18.  $-\frac{1}{4}, \frac{3}{8}, -\frac{3}{16}, \frac{1}{32}, -\frac{3}{64}, \dots$

Write a rule for the  $n$ th term of the sequence. Then find  $a_{20}$ .

19.  $-3, -1, 1, 3, 5, \dots$

20.  $6, 2, -2, -6, -10, \dots$

21.  $25, 14, 3, -8, -19, \dots$

Write a rule for the  $n$ th term of the sequence. Then find  $a_7$ .

22.  $7, -35, 175, -875, \dots$

23.  $2, \frac{3}{2}, \frac{9}{8}, \frac{27}{32}, \dots$

24.  $3, -\frac{6}{5}, \frac{12}{25}, -\frac{24}{125}, \dots$

Write an explicit rule for the  $n$ th term of the sequence.

25.  $a_{16} = 52; d = 5$

26.  $a_6 = -16; d = 9$

27.  $a_4 = 96; d = -14$

28.  $a_1 = 5; r = 3$

29.  $a_1 = -2; r = 6$

30.  $a_2 = 6; r = 2$

**31. Describe and correct the error in writing the explicit rule for the nth term in the arithmetic sequence 37, 24, 11, -2, ...**

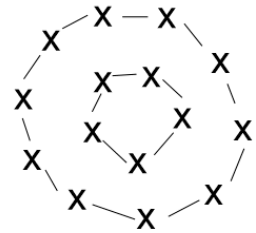
$$a_1 = 37, d = -13.$$

$$a_n = -13 + (n - 1)(37)$$

$$a_n = -50 + 37n$$

**32. In a skydiving formation with R rings, each ring after the first ring has twice as many skydivers as the preceding ring. The formation for R = 2 is shown.**

**a.** Let  $a_n$  be the number of skydivers in the nth ring. Find a rule for  $a_n$ .



**b.** Find the total number of skydivers if there are 4 rings.

**33. A marching band is arranged in 7 rows. The first row has 3 band members, and each row after the first row has 2 more band members than the row before it. Write an explicit rule for the number of band members in the nth row. Then find the total number of band members.**

### **PART C:**

**Determine whether the given sequence is Arithmetic, Geometric, or Neither. Explain why.**

**34.**  $\frac{7}{4}, \frac{5}{4}, \frac{3}{4}, -\frac{3}{4}, -\frac{5}{4}, \dots$

**35.** 0.75, 1.5, 2.25, 3, 3.75, ...

**36.**  $-\frac{5}{2}, -1, \frac{1}{2}, 2, \frac{7}{2}, \dots$

**Write a rule for the  $n$ th term of the sequence. Then find  $a_{20}$ .**

37.  $0, \frac{2}{3}, \frac{4}{3}, 2, \dots$

38.  $2, \frac{5}{3}, \frac{4}{3}, 1, \dots$

39.  $1.5, 3.6, 5.7, 7.8, \dots$

**Write a rule for the  $n$ th term of the sequence. Then find  $a_7$ .**

40.  $7, -4.2, 2.52, -1.512, \dots$

41.  $5, -14, 39.2, -109.76, \dots$

42.  $120, 180, 270, 405, \dots$

**Write an explicit rule for the  $n$ th term of the arithmetic sequence.**

43.  $a_4 = 31; a_{10} = 85$

44.  $a_6 = 39; a_{14} = 79$

45.  $a_3 = -2; a_{17} = 40$

46. During a high school spirit week, students dress up in costumes. A cash prize is given each day to the student with the best costume. The organizing committee has \$1000 to give away over 5 days. The committee wants to increase the amount of the prize by \$50 each day. How much should the committee give away on the first day?

47. A theater has  $n$  rows of seats, and each row has  $d$  more seats than the row in front of it. There are  $x$  seats in the last ( $n$ th) row and a total number of  $y$  seats in the entire theater. How many seats are there in the front row? Write your answer in terms of  $n$ ,  $x$ , and  $y$ .

48. On January 1 of each year, you deposit \$2000 in an individual retirement account (IRA) that pays 5% annual interest. You make a total of 30 deposits. How much money do you have in your IRA immediately after you make your last deposit?