

Mid-Chapter Quiz: Lessons 10-1 through 10-4

Determine whether each sequence is arithmetic, geometry, or neither. Explain your reasoning.

1. $5, -3, -12, -22, -32, \dots$

ANSWER:

Neither; no common ratio or difference

2. $\frac{1}{5}, \frac{7}{10}, \frac{6}{5}, \frac{17}{10}, \frac{11}{5}, \dots$

ANSWER:

Arithmetic; common difference of $\frac{1}{2}$

3. **HOUSING** Laura is a real estate agent. She needs to sell 15 houses in 6 months.

a. By the end of the first 2 months she has sold 4 houses. If she sells 2 houses each month for the rest of the 6 months, will she meet her goal? Explain.

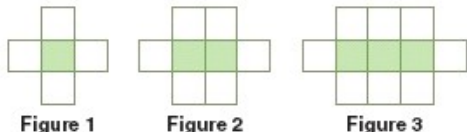
b. If she has sold 5 houses by the end of the first month, how many will she have to sell on average each month in order to meet her goal?

ANSWER:

a. No, she will have 11 houses left to sell in 4 months. If she sold 2 houses per month for the remaining 4 months, she would only sell 8 more houses.

b. 2 houses

4. **GEOMETRY** The figures below show a pattern of filled squares and white squares.



a. Write an equation representing the n th number in this pattern where n is the number of white squares.

b. Is it possible to have exactly 84 white squares in an arrangement? Explain.

ANSWER:

a. $a_n = 2n + 2$

b. Yes, when $2n + 2 = 84$, $n = 41$. In the 41st figure there will be 84 white squares.

Find the indicated term of each arithmetic sequence.

5. $a_1 = 10, d = -5, n = 9$

ANSWER:

-30

6. $a_1 = -8, d = 4, n = 99$

ANSWER:

384

Find the sum of each arithmetic series.

7. $-15 + (-11) + (-7) + \dots + 53$

ANSWER:

342

8. $a_1 = -12, d = 8, n = 22$

ANSWER:

1584

9. $\sum_{k=11}^{50} (-3k + 1)$

ANSWER:

-3620

10. **MULTIPLE CHOICE** What is the sum of the first 50 odd numbers?

- A 625
- B 2500
- C 2499
- D 2401

ANSWER:

B

Find the indicated term of each geometric sequence.

11. $a_2 = 8, r = 2, a_8 = ?$

ANSWER:

512

12. $a_3 = 0.5, r = 8, a_{10} = ?$

ANSWER:

1,048,576

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13. **MULTIPLE CHOICE** What are the geometric means of the sequence below?

0.5, _____, _____, _____, 2048

F 512.375, 1024.25, 1536.125

G 683, 1365.5, 2048

H 2, 8, 32

J 4, 32, 256

ANSWER:

J

14. **INCOME** Peter works for a house building company for 4 months per year. He starts out making \$3000 per month. At the end of each month, his salary increases by 5%. How much money will he make in those 4 months?

ANSWER:

\$12,930.38

Evaluate the sum of each geometric series.

15. $\sum_{k=1}^8 3 \cdot 2^{k-1}$

ANSWER:

765

16. $\sum_{k=1}^9 4 \cdot (-1)^{k-1}$

ANSWER:

4

17. $\sum_{k=1}^{20} -2 \left(\frac{2}{3}\right)^{k-1}$

ANSWER:

-5.998

Find the sum of each infinite series, if it exists.

18. $\sum_{n=1}^{\infty} 9 \cdot 2^{n-1}$

ANSWER:

No sum exists.

19. $\sum_{n=1}^{\infty} (4) \cdot (0.5)^{n-1}$

ANSWER:

8

20. $\sum_{n=1}^{\infty} 12 \cdot \left(\frac{2}{3}\right)^{n-1}$

ANSWER:

36