Reteaching 11-1

A *sequence* is a set of numbers that follows a pattern.

In an *arithmetic sequence,* each term is found by *adding* a fixed number to the previous term. The number that you add is called the *common difference.*	In a *geometric sequence,* each term is found by *multiplying* the previous term by a fixed number. The number that you multiply by is called the *common ratio.*

Example 1: Find the next three terms in the arithmetic sequence: $8, 5, 2, -1, -4, \ldots$

- The common difference is $5 - 8 = -3$.

- Add -3 for the next three terms.

  $-4 + (-3) = -7$
  $-7 + (-3) = -10$
  $-10 + (-3) = -13$

The next three terms are $-7, -10,$ and -13.

Example 2: Find the next three terms in the geometric sequence: $2, 6, 18, 54, \ldots$

- The common ratio is $\frac{18}{6} = 3$.

- Multiply by 3 for the next three terms.

  $54 \times 3 = 162$
  $162 \times 3 = 486$
  $486 \times 3 = 1,458$

The next three terms are $162, 468,$ and $1,458$.

The sequence: $1, 4, 9, 16, \ldots$ is neither arithmetic nor geometric.

Its pattern is $1^2, 2^2, 3^2, 4^2, \ldots$

Its next three terms are $5^2, 6^2, 7^2,$ or $25, 36, 49$.

Find the common difference or ratio in each sequence.

1. $2, 6, 10, 14, \ldots$

2. $30, 20, 10, 0, \ldots$

3. $-12, -4, 4, 12, \ldots$

4. $6, 12, 24, 48, \ldots$

5. $1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}$

6. $250, 25, 2.5, 0.25, \ldots$

Identify each sequence as *arithmetic, geometric,* or *neither.* Find the next three terms of the sequence.

7. $4, 2, 1, \frac{1}{2} \ldots$

8. $0.2, 0.4, 0.6, 0.8, \ldots$

9. $1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}$

10. $70, 50, 30, 10, \ldots$

11. $1, 2, 1, 2, 1, 2, \ldots$

12. $4, 8, 16, 32, \ldots$

Practice 11-1 .... Sequences

Write the rule for each sequence and find the next three terms.

1. 3, 8, 13, 18, _____ , _____ , _____

2. 7, 14, 28, 56, _____ , _____ , _____

3. 32, 8, 2, $\frac{1}{2}$, _____ , _____ , _____

4. 14, 11, 8, 5, _____ , _____ , _____

5. 35, 23, 11, −1, _____ , _____ , _____

6. 3000, 300, 30, 3, _____ , _____ , _____

Find the next three terms in each sequence. Identify each as
arithmetic, geometric, or *neither.* For each arithmetic or geometric
sequence, find the common difference or ratio.

7. 7.1, 7.5, 7.9, 8.3, _____ , _____ , _____

8. 5, 6, 8, 11, 15, 20, _____ , _____ , _____

9. 8000, 4000, 2000, 1000, _____ , _____ , _____

10. 92, 89, 86, 83, _____ , _____ , _____

11. 3, 9, 27, 81, _____ , _____ , _____

12. 540, 270, 90, 22.5, _____ , _____ , _____

Tell whether each situation produces an *arithmetic sequence, geometric sequence,* or *neither.*

13. The temperature rises at the rate of 0.75°F per hour. _____

14. A toadstool doubles in size each week. _____

15. A person receives a 6% raise each year. _____

Find the first four terms of the sequence represented by each expression.

16. $-5n$

17. $4 + 3(n-2)$