

## Types of Sequences

**Def:** A sequence is simply a list of #'s

**Def:** An Arithmetic sequence is one where the distance (difference) b/w an two successive terms is constant (common difference). (d)

ex:  $1, 2, 3, 4, \dots$   $d=1$       ex:  $d=-4$   
 $\begin{array}{c} \vee \vee \vee \\ 1 \quad 1 \quad 1 \end{array}$        $8, 4, 0, -4, \dots$   
 $\begin{array}{c} \vee \vee \vee \\ -4 \quad -4 \quad -4 \end{array}$

**Def:** A geometric sequence is one where the ratio of each successive pair of terms is constant, this constant ratio is called the common ratio (r).

ex:  $1, 3, 9, 27, \dots$       ex:  $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \dots$   
 $\begin{array}{c} \vee \vee \vee \\ \cdot 3 \cdot 3 \cdot 3 \quad r=3 \end{array}$        $\begin{array}{c} \vee \vee \\ \cdot \frac{1}{2} \cdot \frac{1}{2} \\ r = \frac{1}{2} \end{array}$

**Ex 1** Tell whether the sequence is Arithmetic (A), Geometric (G) or Neither (N). Find the next 2 terms.

Ⓐ  $32, -16, 8, -4, \dots$

Ⓑ  $18, 22, 26, \dots, 34, \dots$

Ⓒ  $\frac{1}{12}, \frac{2}{13}, \frac{3}{14}, \frac{4}{15}, \dots$

**Ex 2** Find the first four terms of the sequence with the given formula. Tell whether it's A, G, or N.

$$t_n = 3 \cdot 2^n$$

**Ex 3** Find the next 2 terms by using the pattern in the differences b/w terms:

1, 2, 6, 15, 31, ...