Honors Algebra II

Notes Section 7.1

Define and Use Sequences and Series

Sequence: a function whose domain is a set of consecutive integers. Understood to begin with 1.

Terms: values in the range of a sequence

Finite Sequence: limited number of terms

Infinite Sequence: unlimited number of terms

Series: when the terms of a sequence are added together

Summation Notation (Sigma Notation): _____

EXAMPLE 1 Write the 1st six terms of

a) $a_n = 2n + 5$

a_1 = _____

a_2 = _____

a_3 = _____

a_4 = _____

a_5 = _____

a_6 = _____

b) $f(n) = (-3)^{n-1}$

f(1) = _____

f(2) = _____

f(3) = _____

f(4) = _____

f(5) = _____

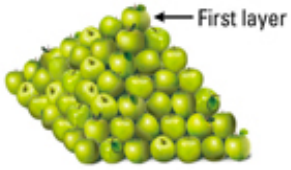
f(6) = _____

EXAMPLE 2 Describe the pattern, write the next term, and write a rule (equation) for the nth term of the sequence.

a) -1, -8, -27, -64, . . .

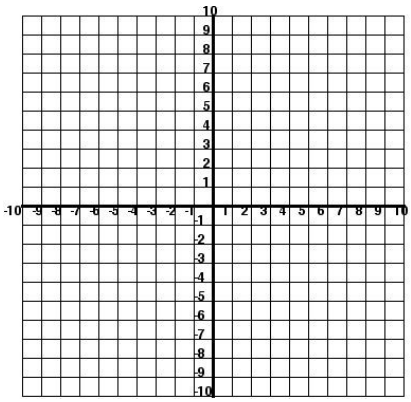
b) 0, 2, 6, 12, . . .

Example 3 You work in a grocery store and are stocking apples in the shape of a square pyramid with 7 layers. Write a rule for the number of apples in each layer. Then graph the sequence.



Layer, n

# of apples, a_n



Rule: _____

EXAMPLE 4 Write the series using summation notation.

a) 25 + 50 + 75 + . . . 250

b) 1/2 + 2/3 + 3/4 + 4/5 + . . .

c) 6 + 36 + 216 + 1296 + . . .

d) 5 + 6 + 7 + . . . + 12

EXAMPLE 5 Find the sum of the series.

$$\sum_{k=4}^{8} (3 + k^2)$$

Formulas for Special Series

Sum of n terms of 1	Sum of first n positive integers	Sum of squares of first n positive integers
$\sum_{i=1}^{n} 1 = n$	$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$	$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$

EXAMPLE 6 How many apples are in the stack in Example 3?

EXAMPLE 7 Suppose there were 9 layers, how many apples in the stack?