**R. Algebra 2 - Arithmetic Series (6)** Name: Hour:

W**** : Answer the following questions for: 12, 13.5, 15, 16.5, . . .

1. Is the above pattern considered an arithmetic sequence? Why or why not?
2. Write the pattern above as a recursive formula and an explicit formula.
3. What is the 120th term to this sequence?

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***Complete your “Walking for a Cause” Investigation!***

Did you go to a concert this summer? Where at? For those of you who went to DTE, Meadowbrook, or Freedom Hill you attended a venue known as an amphitheatre.

The first amphitheatres were actually built for contests between gladiators (like Russell Crowe). As you probably know, amphitheatres get wider as the distance from the stage increases.

Suppose a small amphitheater can seat 18 people in the first row and each row moving back from the stage can seat 4 more people than the previous row.

Give an example of an arithmetic sequence using the information below:

If there is a sellout at the concert and you want to know how many people are at the concert how could you go about finding this out?

If we wanted to find the total # of people by finding the sum of our sequence, we are exploring a topic called an ***arithmetic*** ***series***.

***Arithmetic Series-***

For our amphitheatre the ***arithmetic*** ***series*** for the first four rows is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Would it be easy to quickly find the total number of seats in a large venue such as DTE?

In order to quickly find the sum of an arithmetic series we can derive a general formula for the sum.

* Use your “**Walking for a Cause”** investigation to develop this formula::

**Sum of an arithmetic series, **:

**Ex 1:** Find the sum of the first 100 positive integers.

**Ex 2:** Find the sum of the first 50 terms of an arithmetic series where $a\_{1}=5$ and $d=25$.

**Ex 3**: Find the first three terms of an arithmetic series in which: 

**Ex 4:** If the amphitheatre we discussed has 65 rows, what would the attendance of a sellout crowd be?

***Sigma Notation:***

For the arithmetic series: 3+6+9+12+….+30 we can use: 

**Ex 5:** (a) Write out the series represented by:  (b) Find the sum of the series.