Arithmetic and Geometric Series - Lesson #2

MCR3U

Jensen

DO IT NOW!

In an arithmetic sequence, $t_3=25$ and $t_9=43$. Determine the formula for the general term of this sequence.

Arithmetic

Sequence:

$$t_n = a + (n-1)d$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$
$$S_n = \frac{n}{2} (a + t_n)$$

$$S_n = \frac{n}{2}(a + t_n)$$

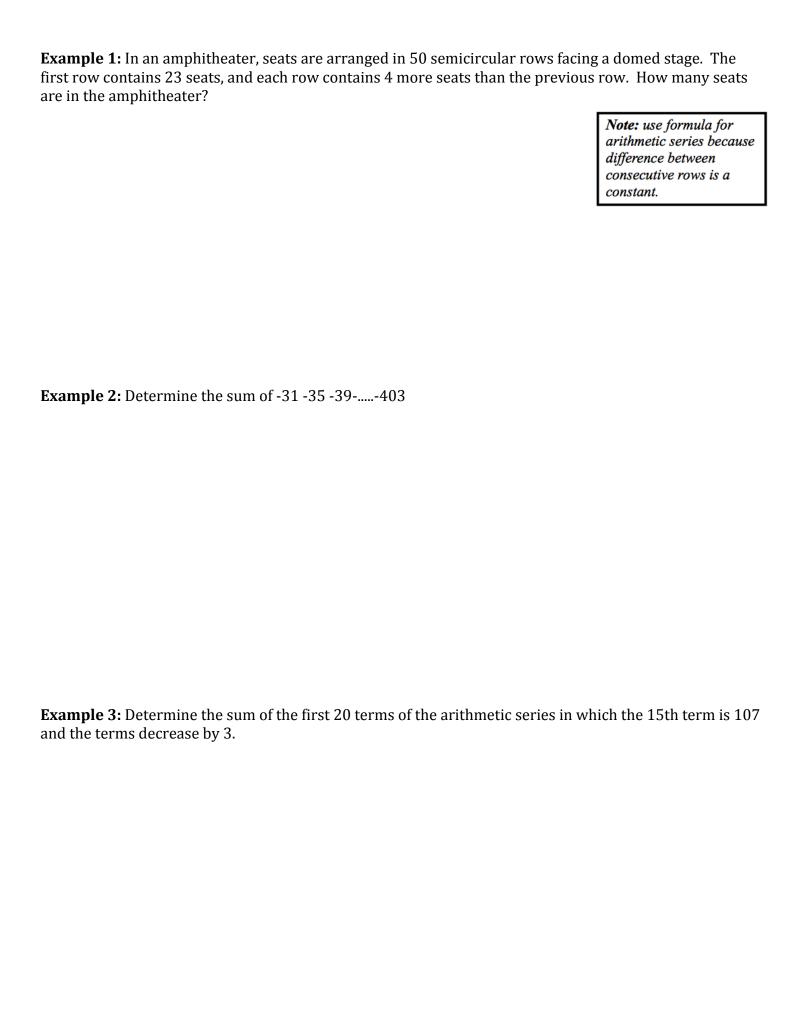
Geometric

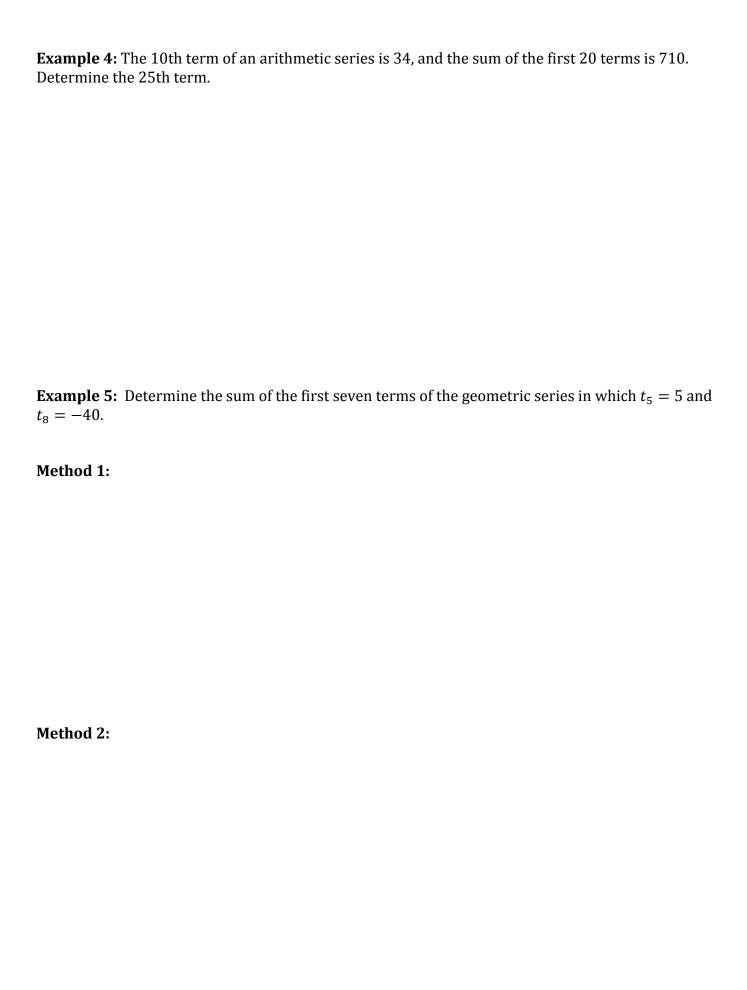
Sequence:

$$t_n = a \cdot r^{n-1}$$

Series:

$$S_n = \frac{a(r^n - 1)}{r - 1}$$





Method 2: Solve using logarithms	Figure out how many terms are in the series by solving for <i>n</i> in the formula:
Method 3: Solve using powers with the same base	

Example 6: Calculate the sum of the geometric series, 960 + 480 + 240 +....+15

Method 1: write out full series

Example 7: A tennis tournament has 128 entrants. A player is dropped from the competition after losing one match. Winning players go on to another match. What is the total number of matches that will be played in this tournament?

Note: The first term is 128/2 = 64 because 2 players participate in one match. The last term is 1 but we don't know what term number it is.