

# Discrete Assignment

## EE1205 Signals and Systems

Kurre Vinay  
EE23BTECH11036

**Question 11.9.3.8:** Find the sum to indicated number of term in each of the geometric progressions in  $\sqrt{7}, \sqrt{21}, 3\sqrt{7}, \dots, n$  terms

**Solution:** Sum of the geometric progression of  $\sqrt{7}, \sqrt{21}, 3\sqrt{7}, \dots, n$  terms is  
The common ratio of geometric progression is

$$r = \frac{a_2}{a_1} \quad (1)$$

common ratio

$$r = \frac{\sqrt{21}}{\sqrt{7}} \quad (2)$$

$$= \sqrt{3} \quad (3)$$

first term of the geometric progression is

$$u(n) = \sqrt{7} \quad (4)$$

$x(n)$  is the  $n^{th}$  term of the geometric progression

$$x(n) = u(n) * r^{(n-1)} \quad (5)$$

$$x(n) = u(n) * \sqrt{3^{(n-1)}} \quad (6)$$

$$x(n) = \sqrt{7 * 3^{(n-1)}} \quad (7)$$

sum of n term in geometric progression is

$$S_n = \frac{u(n)(r^n - 1)}{r - 1} \quad (8)$$

Then, Sum of n term of given geometric progression is

$$S_n = \frac{\sqrt{7}(\sqrt{3}^n - 1)}{(\sqrt{3} - 1)} \quad (9)$$

$$= \frac{\sqrt{7}(\sqrt{3}^n - 1)}{(\sqrt{3} - 1)} \quad (10)$$

**Input Table:**

Term	geometric progression
1 <sup>th</sup>	$\sqrt{7}$
2 <sup>th</sup>	$\sqrt{21}$
3 <sup>th</sup>	$3\sqrt{7}$
4 <sup>th</sup>	$3\sqrt{21}$
5 <sup>th</sup>	$9\sqrt{7}$
6 <sup>th</sup>	$9\sqrt{21}$
n <sup>th</sup>	$\sqrt{7} * 3^{n-1}$