

# School of Excellence Secondary School 2016 A.Y

## Maths Work Sheet for Grade 12<sup>th</sup>

### Work Sheet 1

- List the first five terms of each of the sequences whose general terms are given below where  $n$  is a positive integer
  - $a_n = \frac{n^n}{n!}$
  - $a_n = (-1)^n + (-1)^n \operatorname{sgn}(n\pi)$
  - $a_n = \operatorname{sgn}(3-n)$
  - $a_n = ne^{-2n}$
- Find three numbers in geometric progression such that their sum is  $\frac{13}{3}$  and the sum of their squares is  $\frac{91}{6}$
- Find the sum of all natural number between 100 and 1000 which are multiple of 5
- In an arithmetic progression the 1<sup>st</sup> term is 2 and the sum of the 1<sup>st</sup> five terms is one quarter of the next five terms . show that the 20<sup>th</sup> term is - 112
- How many terms of the arithmetic progression  $-6, \frac{-11}{2}, -5, \dots$  are needed to give the sum -25.
- The sum of a certain number of terms of the arithmetic progression 26, 22, 19, . . is 116. Find the last term.
- If the sum of  $n$  terms of an arithmetic progression is  $(pn + qn^2)$ , where  $p$  and  $q$  are constants, find the common difference
- If the  $n$ th partial sum of an arithmetic sequence  $\{a_n\}$  is  $4n^2$ , find  $a_n$  and  $a_{10}$
- Convert this mixed recurring decimal  $0.31\bar{7}$  to fraction
- Convert the mixed recurring decimal to fraction
  - $0.3\bar{7}$
  - $0.1\bar{4}$
- Find  $p: \sum_{k=1}^{\infty} 27p^k = \sum_{x=1}^{12} (24 - 3x)$
- Find the product  $4 \times 4^{\frac{1}{2}} \times 4^{\frac{1}{4}} \times 4^{\frac{1}{x}} \times 4^{\frac{1}{n}} \times \dots$
- If  $\sum_{k=1}^{\infty} 5^{kt} = \frac{1}{24}$  find the value of
- If the product  $5^k \cdot 5^{k^2} \cdot 5^{k^3} \dots = 5$ , find  $k$
- $\sum_{k=1}^{11} (2 + 3k) \cdot k$
- The sum of the first three terms of a geometric progression is 39 and their product is .  
find the 10 common ratio and the three terms
- How many terms of geometric progression  $3, 3^2, 3^3, \dots$  are needed to give the sum 120?

18. The sum of first three terms of a geometric progression is 16 and the sum of the next

three terms is 128. Determine the first term, the common ratio and the sum  
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$n$  terms of the geometric progression.

19. If the 4<sup>th</sup>, 10<sup>th</sup> and 16<sup>th</sup> terms of a geometric progression are  $x, y$  and  $z$  respectively

Prove that  $x, y, z$  are in geometric progression