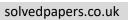
## AQA – Sequence and series – A2 Mathematics P3

1. June/2020/Paper\_3/No.7

(a) Using 
$${}^{n}C_{r} = \frac{n!}{r!(n-r)!}$$
 show that  ${}^{n}C_{2} = \frac{n(n-1)}{2}$  [2 marks]  
[3 marks]  
[3 marks]  
[3 marks]  
[3 marks]  
[3 marks]



(b) (ii) Hence, solve the equation

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2.	June/202	20/Paper_3/No.8 The sum to infinity of a geometric series is 96	
		The first term of the series is less than 30	
		The second term of the series is 18	
	(a)	Find the first term and common ratio of the series.	[5 marks]

(b) (i) Show that the *n*th term of the series,  $u_n$ , can be written as

 $u_n = \frac{3^n}{2^{2n-5}}$ 

[4 marks]

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(b) (ii) Hence show that

$$\log_3 u_n = n(1 - 2\log_3 2) + 5\log_3 2$$

[3 marks]

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3.	June/2019/Paper_3/No.2 Find the value of $\frac{100!}{98! \times 3!}$							
	Circle your answer.				[1 mark]			
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**4.** June/2019/Paper\_3/No.3

Given  $u_1 = 1$ , determine which one of the formulae below defines an increasing sequence for  $n \ge 1$ 

Circle your answer.

[1 mark]

$$u_{n+1} = 1 + \frac{1}{u_n}$$
  $u_n = 2 - 0.9^{n-1}$   $u_{n+1} = -1 + 0.5u_n$   $u_n = 0.9^{n-1}$