alysis H AtPS Quiz 2 2019/20 _____ has learned the factorials ~~of life.~~

eggeller / Gleason / Tantod Period: _____

1. Use mathematical induction to prove that the given formula works for all positive integers n. [7]

$1\cdot 3+2\cdot 4+3\cdot 5+\ldots+n(n+2)=n(n+1)(2n+7)/6$

2. Use the formula $(n+2)!-n!=n!(n^2+3n+1)$

to derive a compact expression for: $0!+11(2!)+29(4!)+\ldots+(4m^2+6m+1)[(2m)!]$

Show clear and careful work. [4]

3. Write without factorials and simplify: $\frac{\left[(n+1)!\right]^2}{n!(n-1)!}$ _____ [3]

4. Simplify $\begin{pmatrix} -3 \\ 12 \end{pmatrix}$

_____ [3]

5. The geometric mean of 6, 36, and 216 is a whole number. Find it. Explain what this number represents.

Geo mean_____ Explain _____ [3]

6. a) Find the 30th term of the Geometric Sequence with third term 24 and sixth term 3. (Decimal form of answer not needed.)

_____ [3]

b) Consider the Infinite Geometric Series that corresponds to the sequence described in part "a". Will the Series have a finite sum? Yes or No: _____. Explain: [3]

7. Calculate the sum 11 + 14 + 17 + ... + 761. Write your answer as a product of two numbers. [4]

Answer:_____