Pre-Calculus Worksheet Name: _____

Section 9.1 Day Two Period: ____

I. Write an explicit formula for the n^{th} term of the sequence. (Assume that n begins with 1.)

1. $1,\frac{1}{2},\frac{1}{6},\frac{1}{24},\frac{1}{120}$	2. $1,2,\frac{2^2}{2},\frac{2^3}{6},\frac{2^4}{24}$	3. $2,1,\frac{4}{5},\frac{5}{7},\frac{2}{3}$ Hint… rewrite the fractions.
4. $a_1=25$ and $a_{n+1}=a_n-5$	5. $a_1=6$ and $a_{n+1}=a_n+2$	6. $a_1=6$ and $a_{n+1}=\frac{1}{3}a_n$

II. Write the first five terms of the sequence. (Assume that n begins with 0.)

7. $a_n=\frac{3^n}{n!}$	8. $a_n=\frac{1}{(n+1)!}$	9. $a_n=\frac{(-1)^{2n+1}}{(2n+1)!}$

III. Simplify the factorial expression.

10. $\frac{5!}{8!}$	11. $\frac{212!}{209!}$	12. $\frac{115!}{116!}$
13. $\frac{(n+1)!}{n!}$	14. $\frac{(n+1)!}{(n+3)!}$	15. $\frac{(n+4)!}{(n+2)!}$

IV. Find the sum WITHOUT the calculator.

16. $\sum_{i=1}^{5}(2i+1)$	17. $\sum_{k=1}^{4}10$
18. $\sum_{j=0}^{4}j^2$	19. $\sum_{k=5}^{6}(2k-4)$

V. Find the sum WITH the calculator. Write down what you type into the calculator, please.

20. $\sum_{i=1}^{6}(24-3i)$	21. $\sum_{j=1}^{10}\left(\frac{3}{j+1}\right)$
22. $\sum_{k=0}^{4}\frac{(-1)^k}{k+1}$	23. $\sum_{k=0}^{4}\frac{(-1)^k}{k!}$

VI. Rewrite the sum using sigma notation.

24. $\frac{1}{3(1)}+\frac{1}{3(2)}+\frac{1}{3(3)}+\ldots+\frac{1}{3(9)}$	25. $\frac{5}{1+1}+\frac{5}{1+2}+\frac{5}{1+3}+\ldots+\frac{5}{1+15}$
26. $3-9+27-81+243-729$	27. $1-\frac{1}{2}+\frac{1}{4}-\frac{1}{8}+\ldots-\frac{1}{128}$
28. $\left[2\left(\frac{1}{8}\right)+3\right]+\left[2\left(\frac{2}{8}\right)+3\right]+\ldots+\left[2\left(\frac{8}{8}\right)+3\right]$	29. $\left[1-\left(\frac{1}{6}\right)^2\right]+\left[1-\left(\frac{2}{6}\right)^2\right]+\ldots+\left[1-\left(\frac{7}{6}\right)^2\right]$