Precalc BC Series, Inductive Proofs and e Extra Review

1. Given a geometric series starting with $a_n = 1$, find the range of values to which the series can converge.

2. The first and third terms of a sequence are, respectively, ¾ and ½ . Find the difference between the arithmetic mean and the harmonic mean of these two terms.

3. Find the sum of the geometric series: 17 – 51 + 153 - …+ 1,003,833.

4. Evaluate: a) $\sum_{n=2}^{20} 5^n$ b) $\sum_{n=0}^{\infty} \frac{(-2)^n}{n!}$

5. Given a geometric series with *r* a non-real number, $a_1 = a_4 = 2$, find $a_{20} \times a_{21}$.

6. An arithmetic series has $a_7 = 35$ and $a_{19} = -1$. Find the sum of the first 20 terms.

7. The coefficient of the x^3y^4 term of the expansion of $\left(2x+ky\right)^7$ is 672,280. Find the value of *k*.

8. Write the first five terms in the expansion of cos(π).

9. Prove inductively: $1-2+4-8+...\left(-2\right)^{n-1}=\frac{1-\left(-2\right)^n}{3}$