Math 112 Series Review

Name:_____

Do the following series converge or diverge? If it is possible to find the sum of a convergent series, do so. Justify all your answers by showing your work and stating which test you're using. Show that the hypotheses are satisfied for any test you use.

1. $\displaystyle\sum_{k=1}^{\infty} \frac{\arctan(k)}{k^{1.1}}$.

2. $\displaystyle\sum_{k=1}^{\infty} \frac{1}{k^4}$.

3. $\displaystyle\sum_{n=1}^{\infty} \frac{(2^n)n!n!}{(2n)!}$.

4. $\displaystyle\sum_{n=2}^{\infty} (-1)^{n+1} \left(\frac{\ln(n)}{\ln(n^2)} \right)^n$.

5. $\displaystyle\sum_{k=3}^{\infty} \frac{\sin(k\pi)\ln(k)}{k}$.

6. $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{\sin(n)}{n^2}$.

7. $\displaystyle\sum_{k=3}^{\infty} \frac{7}{k}$.

8. $\displaystyle\sum_{n=2}^{\infty} \frac{\pi^{ne}}{e^{\pi n}}$.

9. $\displaystyle\sum_{n=0}^{\infty} \frac{\sqrt{2n^2 + 3n + 1}}{n^2 + 5}$.

10. $\displaystyle\sum_{k=1}^{\infty} \frac{\sin^2(k)}{2^k + 3}$.

11. $\displaystyle\sum_{k=4}^{\infty} e^{-k+1}$.

12. $\displaystyle\sum_{k=1}^{\infty} \frac{k^k}{k!}$.

13. $\displaystyle\sum_{j=7}^{\infty} \frac{10}{\sqrt[4]{j}}$.