Math 1552, Integral Calculus
Sections 10.3-10.5: Convergence Tests

Determine whether the following series converge or diverge. Justify your answers using the tests we discussed in class.

1. $\displaystyle\sum_{n=1}^{\infty} \frac{1 \cdot 3 \cdot 5 \cdot \ldots \cdot (2n-1)}{4^n 2^n n!}$

2. $\displaystyle\sum_{k=1}^{\infty} \frac{k+2}{\sqrt{k^5+4}}$

3. $\displaystyle\sum_{n=1}^{\infty} \frac{-8}{\left(2+\frac{1}{n}\right)^{2n}}$

4. $\displaystyle\sum_{k=1}^{\infty} \frac{3^{2k}}{8^k - 3}$

5. Suppose $r > 0$. Find the values of r, if any, for which $\displaystyle\sum_{k=1}^{\infty} \frac{r^k}{k^r}$ converges.