

Quiz 15 - Math 152

For each of the following series, tell whether it is absolutely convergent, conditionally convergent, or divergent.

1. $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{3}{n+6}$
2. $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{3n-1}$
3. $\sum_{n=1}^{\infty} (-1)^n \frac{3n-1}{2n+1}$
4. $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{e^{1/n}}{n}$
5. $\sum_{n=1}^{\infty} (-1)^n \sin\left(\frac{\pi}{n}\right)$

Solutions.

1. Conditionally convergent (compare to p -series with $p = 1$).
2. Conditionally convergent (again compare to p -series with $p = 1$).
3. Divergent (individual terms do not go to 0).
4. Conditionally convergent (compare to p -series with $p = 1$).
5. Conditionally convergent - follows from the fact that

$$\lim_{n \rightarrow \infty} \frac{\sin n}{n} = 0$$