Does $\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$ diverge, converge absolutely, or converge conditionally?

Solution

$\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$ is a p-series with $p = \frac{3}{2}$. Since $p > 1$, the series $\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$ converges by the p-series test.

Since $\sum |a_n| = \sum a_n$, the series $\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$ converges absolutely.

Other solution

You can also use the Integral Test, but when the p-test works, why work more?