

WRITE YOUR NAME:

MAC 2312 Quiz 16
Thursday March 21st

Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$

This is a P-SERIES with $p = 2 > 1$
Since $p > 1$, we know the series CONVERGES.

The above answer is worth 100%.

You can also use the INTEGRAL TEST.

$f(x) = \frac{1}{x^2}$ is positive and decreasing,

$$\text{so consider } \int_1^{\infty} \frac{1}{x^2} dx = \int_1^{\infty} x^{-2} dx = \left[\frac{x^{-1}}{-1} \right]_1^{\infty}$$

$$= \left[-\frac{1}{x} \right]_1^{\infty} = \left[\frac{1}{x} \right]_{\infty}^1 = \frac{1}{1} - \frac{1}{\infty} = 1 - 0 = 1$$

just a number

The improper integral converges, so the given series CONVERGES
by the integral test.