

Math 2315 - Calculus 2

Quiz #14 - 2017.03.20

Solutions

Determine whether the following sequence converges or diverges:

$$a_n = (-1)^n \frac{2n^2 \cos(n)}{n^3 + 4}$$

We rewrite this as

$$a_n = \frac{2n^2}{n^3 + 4} (-1)^n \cos(n),$$

and taking absolute values gives

$$|a_n| = \frac{2n^2}{n^3 + 4} |\cos(n)| < \frac{2n^2}{n^3 + 4}$$

and since

$$\lim_{n \rightarrow \infty} |a_n| = 0,$$

we have

$$\lim_{n \rightarrow \infty} a_n = 0.$$