

PRINT Your Name: \_\_\_\_\_

**Quiz – March 16, 2004**

Consider the sequence whose  $n^{\text{th}}$  term is  $a_n = \frac{\cos(n\pi)}{n}$ . What are the first few terms of this sequence? Find the limit of the sequence.

**Answer:** The first few terms of the sequence are  $a_1 = -1$ ,  $a_2 = \frac{1}{2}$ ,  $a_3 = \frac{-1}{3}$ , and  $a_4 = \frac{1}{4}$ . We see that

$$\frac{-1}{n} \leq a_n \leq \frac{1}{n}.$$

Therefore,

$$0 = \lim_{n \rightarrow \infty} \frac{-1}{n} \leq \lim_{n \rightarrow \infty} a_n \leq \lim_{n \rightarrow \infty} \frac{1}{n} = 0.$$

We conclude that  $\boxed{\lim_{n \rightarrow \infty} a_n = 0}$ .