

Math 112 Homework for Friday, Week 8

1. Using the definition of a limit prove that

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

2. For the following sequences find the limit or determine that it does not converge

(a)  $\left\{\left(\frac{i}{3}\right)^n\right\}$

(b)  $\{(2 - i)^n\}$

(c)  $\{4^{\frac{n}{2}}\}$

3. Using limit theorems find the following limit

$$\lim_{n \rightarrow \infty} \frac{3n^2 - 1}{5n^2 + n + 2}$$