

QUIZ 3

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1. 4 points You are given a formula for the  $n$ th term  $a_n$  of a sequence  $\{a_n\}$ . Find the values  $a_1, a_2, a_3, a_4$ .

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

2. 4 points Does the following sequence converge, or does it diverge? Find the limit if it is a convergent sequence. **Explain!**

$$a_n = \frac{\cos n}{n^2}$$

3. 4 points Does the following sequence converge, or does it diverge? Find the limit if it is a convergent sequence. **Explain!**

$$a_n = \frac{7 + 10n^4}{4n^3 - n^2 + 5}$$

4. 4 points Show that the following sequence is decreasing.

5. 4 points A sequence  $\{a_n\}$  is given recursively, as follows:

$$a_1 = \sin(1) \quad a_2 = \max\{a_1, \sin(2)\} \quad \dots \quad a_{n+1} = \max\{a_n, \sin(n+1)\} \quad \dots$$

Show that the sequence converges.