

LAST NAME:

FIRST NAME:

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**MATH 65B - Spring 2018**

Groupwork 10: April 12, 2018

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1. Find the general term  $a_n$  of the sequence:

(a)  $\{1, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}, \dots\}$

(b)  $\{2, 7, 12, 17\}$

(c)  $\{1, -\frac{2}{3}, \frac{4}{9}, -\frac{8}{27}, \dots\}$

(d)  $\left\{ \sin\left(\frac{\pi}{2}\right), \sin\left(\frac{3\pi}{2}\right), \sin\left(\frac{5\pi}{2}\right), \dots \right\}$

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Please, show all work.

2. Determine whether the sequence converges or diverges. If it converges, find its limit.

$$(a) \quad a_n = n \sin \left( \frac{1}{n} \right)$$

$$(b) \quad a_n = \left( 1 + \frac{2}{n} \right)^n$$

$$(c) \quad a_n = \frac{n!}{2^n}$$

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**Please, show all work.**

3. Determine whether the series converges or diverges. If it converges, find its sum. You must show all the steps!

$$\sum_{n=1}^{\infty} \left( \frac{1}{e^n} + \frac{1}{n(n+1)} \right)$$

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Please, show all work.

4. For (a), determine whether the series converges or diverges. For (b), write the repeating decimal as a ratio of integers (ie. a rational number). For (c), determine for which values of  $x$  does the series converges.

$$(a) \quad \sum_{n=1}^{\infty} \frac{1}{e^n}$$

$$(b) \quad 4.342342342 \dots$$

$$(c) \quad \sum_{n=0}^{\infty} \frac{\cos^n(x)}{2^n}$$

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Please, show all work.