

Course

MATH 1C

Student ID

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Test

QUIZ 1

Question

2a

2b

Points

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MAX:  $6\frac{1}{2}$

MAX:  $2\frac{1}{2}$

Question

3a

3b

3c

Points

	$\frac{1}{2}$	
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MAX: 9

MAX:  $9\frac{1}{2}$

MAX:  $7\frac{1}{2}$

Total

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MAX: 35

$$[2][a] \quad a_{n+1} - a_n = \left| \frac{6^{n+1}}{(2n+2)!} - \frac{6^n}{(2n+1)!} \right| \text{(*)}$$

$$= \left| \frac{6^{n+1} - 6^n(2n+2)}{(2n+2)!} \right| \text{(*)}$$

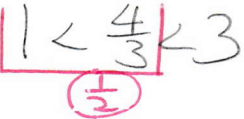
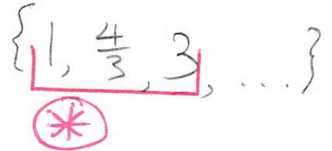
$$= \frac{6^n [6 - 2n - 2]}{(2n+2)!}$$

$$\text{(*)} \left| \frac{-2 \cdot 6^n (n-2)}{(2n+2)!} \right| < 0 \quad \text{IF } n > 2 \text{ (*)}$$

$\{a_n\}$  IS NOT MONOTONIC (\*)

WHICH DOESN'T  
INCLUDE  $n=1, 2$

[b]



INCREASING

[3][a]

$$\frac{2n^2 + \sqrt[3]{n^7}}{3n^2 + \sqrt[3]{n^7}} > \left| \frac{2n^2}{n^{\frac{7}{3}}} \right| = \frac{2}{n^{\frac{1}{3}}} > 0 \quad \left( \frac{1}{2} \right)$$

$$\left( \frac{1}{2} \right) \left| 2 \sum_{n=1}^{\infty} \frac{1}{n^{\frac{1}{2}}} \text{ DIV} \right| \quad \left( \text{p-SERIES } p < 1 \right)$$

(1)                      (1/2)

SO

$$\left| \sum_{n=1}^{\infty} \frac{2n^2 + \sqrt[7]{n^3}}{3n^2 + \sqrt[3]{n^7}} \text{ DIV} \right| \quad \left( \text{COMPARISON} \right) \quad \left( \frac{1}{2} \right) \quad \left( * \right)$$

$$[6] \quad (2 - e^{\frac{1}{n}})^n > 1^n = 1 > 0$$

$$\sum_{n=1}^{\infty} 1 \quad \text{DIV}$$

so  $\sum_{n=1}^{\infty} (2 - e^{\frac{1}{n}})^n \text{ DIV (COMPARISON)}$

$\frac{1}{2}$

$$[c] \quad |3 \leq 7 - 4 \cos n \leq 11| \textcircled{1}$$

$$\textcircled{\frac{1}{2}} \quad |0 \leq (7 - 4 \cos n) e^{-n} \leq 11 e^{-n}| \textcircled{1}$$

$$\textcircled{\frac{1}{2}} \quad \left| \sum_{n=1}^{\infty} \frac{1}{e^n} \text{ CONV} \right| \quad \left( \text{GEOMETRIC} \quad |r| < 1 \right)$$

~~CONV~~

$\textcircled{1}$

$\textcircled{\frac{1}{2}}$