MA 271: Several Variable Calculus

Chapter 11 and Taylor Series (practice)

NAME _____ Lecture Meeting Time _____

NO CALCULATORS, BOOKS, OR PAPERS ARE ALLOWED. Use the back of the test pages for scrap paper.

Points awarded

1. (5 pts) _____	**7. (5 pts)** _____
2. (5 pts) _____	**8. (5 pts)** _____
3. (5 pts) _____	**9. (5 pts)** _____
4. (5 pts) _____	**10. (5 pts)** _____
5. (5 pts) _____	**11. (5 pts)** _____
6. (5 pts) _____	**12. (5 pts)** _____

Total Points: _____

1.

$$\lim_{n\to\infty}(\sin(\frac{2}{n}))^{1/n} =$$

A. $\boxed{1}$

B. 0

C. 2

D. e

E. diverge

2.

$$\lim_{n\to\infty} n\sin(\frac{2}{n}) =$$

A. 1

B. 0

C. $\boxed{2}$

D. e

E. diverge.

3. What is the sum of

$$\sum_{n=1}^{\infty}\sin(n\pi)$$

A. 1

B. $\boxed{0}$

C. 2

D. $\frac{1}{2}$

E. diverge

4. What is the sum of

$$\sum_{n=1}^{\infty}\sin(\frac{n\pi}{2})$$

A. 1

B. 0

C. 2

D. $\frac{1}{2}$

E. $\boxed{\textbf{diverge}}$

5. What is the value of m if

$$\sum_{n=1}^{\infty} \frac{1}{2^{n+5}} = \sum_{n=m}^{\infty} \frac{1}{2^n}$$

A. 1

B. 0

C. 5

D. -5

E. $\boxed{6}$

6. What is the value b such that

$$1 + e^b + e^{2b} + e^{3b} + \cdot = 9$$

A. $\boxed{-\ln(\frac{9}{8})}$

B. $\ln(\frac{9}{8})$

C. $\frac{8}{9}$

D. -2

E. -1

7. Find all values of x, such that the following series converge

$$\sum_{n=1}^{\infty} \frac{(x-2)^n}{10^n}.$$

A. $\boxed{-8 < x < 12}$

B. $-8 \leq x < 8$

C. $-8 < x \leq 12$

D. $-12 \leq x < 12$

E. $-12 < x < 12$

8. **What is the sum of** $3/2 + 1 + 2/3 + (2/3)^2 + (2/3)^3 + \cdots$

   A. -6
   B. $\boxed{\mathbf{9/2}}$
   C. 6
   D. 9
   E. 15

9. **Evaluate the sum of** $sin(\pi/2) + \sin(\pi) + sin(3\pi/2) + \sin(2\pi) + \cdots$

   A. -6
   B. $\boxed{\textbf{diverge}}$
   C. 6
   D. 9
   E. 15

10. **The series** $\frac{10}{1!} - \frac{10^2}{2!} + \frac{10^3}{3!} - ...$

    A. diverge
    B. $\boxed{\textbf{converge absolutely}}$
    C. converge only conditionally
    D. 9
    E. 15

11. **By using a linear approximation of** $f(x, y) = \sqrt{x^2 + y}$ **at** $(4, 9)$**, compute the approximate value of** $f(5, 8)$**.**

    A. 5.2
    B. 5.3
    C. 5.5
    D. $\boxed{5.7}$
    E. 5.9

12. Find cubic approximation of $f(x,y) = \dfrac{1}{1-x-y+xy}$ near the origin.

A. $\boxed{1+x+y+x^2+xy+y^2+x^3+x^2y+xy^2+y^3}$

B. $1+x+y+x^2+xy+y^2+x^3+x^2y+xy^2$

C. $1+x^2+xy+y^2+x^3+x^2y+xy^2+y^3$

D. $1+x+y+x^2+xy+y^2+x^3+3x^2y+3xy^2+y^3$

E. $1+x+y+x^2+xy+y^2+2x^3+x^2y+xy^2+2y^3$

13. By using a linear approximation of $f(x,y) = x^2 - x + \sin(y)$ at $(2,0)$, compute the approximate value of $f(1.9, 0.1)$.

A. $\boxed{1.8}$

B. 1.85

C. 1.9

D. 2

E. 3.5