

Math 2315 - Calculus 2

Cumulative Quiz #5 - 2021.04.19

Name: _____

1. Compute the first 4 terms in the Taylor's series of $f(x) = \sqrt{1+x}$ at $x = 3$.

2. Find the Maclaurin series for $f(x) = e^{-2x}$.

3. Find all values of x for which the following series converges:

$$\sum_{k=1}^{\infty} \frac{1}{k^2} (3x + 2)^k$$

4. Consider the parametric equation $(x(t), y(t)) = (e^t, 4e^{2t})$ for $t \in (-\infty, 1)$.

(a) Sketch a graph of the curve for $t \in (-\infty, 1)$.

(b) Find the slope of the tangent line of the parametric curve when $t = 3$.

5. Consider the parametric equation $(x(t), y(t)) = (\cos(t), 2\sin(2t))$ for $t \in [0, 2\pi]$.

(a) Sketch a graph of the curve for $t \in [0, 2\pi]$.

(b) Locate all points (x, y) on the graph where the function will have a vertical OR horizontal tangent line.

6. Compute the following integrals.

(a) $\int \frac{6u^3}{u+1} du$

(b) $\int \sin(\ln(t)) dt$

(c) $\int \sin^3(\theta) \cos^6(\theta) d\theta$