MAC 2312 - Calculus II — Florida Int'l Univ.

Revision for Test #3 — 10.1 – 10.10, 11.1 – 11.3

Remember to bring a blue exam booklet

MAIN PROBLEM SOLVING TECHNIQUES:

1. Determining if an infinite seq. is increasing or decreasing.
2. Finding the values to which Geometric & Telescoping series conv.
3. Testing inf. series with only pos. terms for conv. & div. by using (a) div. test (b) integral test (c) comp. test (d) ratio test (e) root test.
4. Testing inf. series with both pos. & neg. terms for conv. & div. by using the abs. value conv. test, div. test. ~~and~~ alt. series test
5. Testing inf. series for abs. conv., cond. conv. & divergence.
6. Finding the radius of conv. & interval of conv. of power series.
7. Differentiating & integrating power & shifted power series.
8. Finding Maclaurin & Taylor polynomials, formulas & series
9. Sketching curves and finding areas & arclength in polar coord.
10. Sketching curves and finding areas & arclength in parametric eq.

MAIN DEFINITIONS: Maclaurin polynomial, formula & series, absolute convergence, conditional convergence, alternating series, radius of convergence, interval of convergence. definition of the convergence of an infinite series.

MAIN FORMULAS: 1. $\sum_{k=0}^{\infty} a.r^k = a/(1-r)$ provided that $|r| < 1$.

2. $\sum_{k=1}^{\infty} (a_k - a_{k+p}) = a_1 + \cdots + a_p$ provided $a_k \to 0$ as $k \to \infty$.

3. $\int_1^{\infty} f(x)\,dx \le \sum_{k=1}^{\infty} f(k) \le f(1) + \int_1^{\infty} f(x)\,dx$ provided $f(x)$ decr. to 0 as $x \to \infty$.

4. $P_n(f;x) = \sum_{k=0}^{n} \frac{f^{(k)}(0)}{k!} x^k$, $f(x) = \sum_{k=0}^{\infty} \frac{f^{(k)}(0)}{k!} x^k$ provided $\lim_{n\to\infty} R_n(x) = 0$.

5. $f(x) = \sum_{k=0}^{n} \frac{f^{(k)}(0)}{k!} x^k + \frac{f^{(n+1)}(c)}{(n+1)!} x^{n+1}$ for some c between 0 & x

6. Area $= \int_{\alpha}^{\beta} \frac{1}{2} r^2\,d\theta$, Arclength $= \int_{\alpha}^{\beta} \sqrt{r^2 + (dr/d\theta)^2}\,d\theta$

7. Area $= \int_{t_1}^{t_2} |y(t).x'(t)|\,dt$, Arclength $= \int_{t_1}^{t_2} \sqrt{x'(t)^2 + y'(t)^2}\,dt$