

I will give you the following formulas on Wednesday's test...

$$|f(x) - P_n(x)| \leq \frac{K_{n+1}}{(n+1)!} |x - x_0|^{n+1}$$

$$a_0 = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) dx \quad a_k = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos(kx) dx \quad b_k = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin(kx) dx$$

$$\frac{1}{\sqrt{2\pi}s} e^{-\frac{(x-m)^2}{2s^2}}$$

The test covers **chapter 9, chapter 10, and section 11.1**

Some review problems/suggestions...

- Know how to compute the Taylor/Maclaurin polynomial of a function.
- Section 9.1: Find 5th-order Taylor polynomials for a few functions like $f(x)$ in problems 13-24.
- Know how to read off information from the Taylor polynomial. Like If the 4th-order Taylor polynomial of $f(x)$ centered at $x = -2$ is $P_4(x) = 1 + (x + 2) + 3(x + 2)^2 - (1/2)(x + 2)^3$, then $f(-2) = 1$, $f'(-2) = 1$, $f''(-2) = 2!(3) = 6$, $f'''(-2) = 3!(-1/2) = -3$, and $f^{(4)}(-2) = 0$. In addition, $P_2(x) = 1 + (x + 2) + 3(x + 2)^2$.
- Know how use Taylor's error estimate. For example, try 9.2 problems 3a, 5a, 6a, 9, 11
- Know how to find a Fourier polynomial for a function. Example: try to find a Fourier polynomial of order 2 for $f(x) = x^2$. Also, given a Fourier polynomial, know what the coefficients tell you. For example: $q_1(x) = 3 + 2\sin(x)$ says that $a_0 = 3$, $a_1 = 0$, and $b_1 = 2$ so $\int_{-\pi}^{\pi} f(x) dx = 3(2\pi)$ in other words the average value of $f(x)$ on the interval $I = [-\pi, \pi]$ is 3. Also, $\int_{-\pi}^{\pi} f(x) \sin(x) dx = 2\pi$ and $\int_{-\pi}^{\pi} f(x) \cos(x) dx = 0$.
- Know how to compute with improper integrals. Pick some problems among 10.1 33-48.
- Know how to use the comparison tests from 10.2
- Know what it takes to be a probability distribution and how to set up integrals to compute probabilities.
- Know how to convert from a normal distribution integral to a standard normal integral.
- Know what it means to be a convergent or divergent sequence. Try some suggested homework from 11.1.
- Understand your quizzes! Try extra suggested homework coming from things that give you trouble. Review your notes and examples from class.