

MATH 113 Homework VI

Turn in by December 29, 2003 Monday 12:30.

1. Page 278 Exercise 1. Draw graphs of the Taylor polynomials $T_3(\sin x) = x - x^3/3!$ and $T_5(\sin x) = x - x^3/3! + x^5/5!$. Pay careful attention to the points where the curves cross the x -axis. Compare these graphs with that of $f(x) = \sin x$.

2. Page 278 Exercise 9. Let α be a real constant. Show that

$$T_n((1+x)^\alpha; 0) = \sum_{k=0}^n \binom{\alpha}{k} x^k, \text{ where } \binom{\alpha}{k} = \begin{cases} \frac{\alpha(\alpha-1)\cdots(\alpha-k+1)}{k!} & \text{if } k \geq 1, \\ 1 & \text{if } k = 0. \end{cases}$$

3. a) Find $T_9(\tan x; 0)$,

b) $T_n(\sin x; \frac{\pi}{3})$.