

MAT137Y - SUMMER 2009
WEEK 12: JULY 28th - AUGUST 4th

0.1. Suggested Problems.

§12.4: #3, 5, 7, 9, 15, 18, 21, 25, 26, 29, 32, 36, 41, 44, & 47

§12.5: #5, 6, 9, 11, 15, 19, 23, 27, 36, 44, & 45

§12.6: #1, 3, 5, 7, 9, 11, 14, 25, 27, 49, & 58

§12.7: #3, 4, 5, 11, 14, 23, 25, 29, & 34

0.2. Assigned Problems. Due **August 6th**, in lecture.

(1) Show that $\int_0^{\infty} e^y y^{-y} dy$ converges. (*Hint: Use the integral test.*)

(2) Evaluate $\lim_{x \rightarrow 0} \frac{e^{x^2} - 1 - x^2 - \frac{x^4}{2}}{\cos x - 1 + \frac{x^2}{2} - \frac{x^4}{4!}}$.

(3) Use Taylor's Theorem and estimate (12.6.3) in the text to prove that

$$\cos x = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2k)!} x^{2k}$$

for all $x \in \mathbb{R}$. (*This is 12.6.50*)