

## Math 102 Practice #2 for Exam 2

Spring 2008

1. Find the Taylor polynomial of degree 4 for  $f(x) = \cos x$  at  $a = \frac{\pi}{4}$ .
2. Determine whether the infinite series  $\sum_{n=0}^{\infty} \frac{5^{2-n}}{2^n}$  converges or diverges. If it converges, find its sum.
3. Determine whether the following infinite series converge or diverge.

(a)  $\sum_{n=1}^{\infty} \frac{n}{10n+17}$ .

(b)  $\sum_{n=1}^{\infty} \frac{\ln n}{n}$ .

(c)  $\sum_{n=1}^{\infty} \frac{4+3\sin 2n}{n}$ .

4. Use the Taylor series for  $\cos x$  to find a power series representation for  $x^2 \cos(2x)$ .
5. Consider the series  $\sum_{n=1}^{\infty} \frac{(-1)^n}{3n+4}$ . Does it converge? Does it converge absolutely?

6. Find the interval of convergence of the power series.  $\sum_{n=0}^{\infty} \frac{(2n)!}{(3n)!} x^n$ .