*NAME* : _____ *QUIZ* ***3*** (*SECTION* ***207***)

**Problem 1.** *Find the Maclaurin series of* $f(x) = \frac{1}{\sqrt{2-x}}$.

**Problem 2.** *Evaluate* $\int_0^1 e^{-x^2}\,dx$ *correct to within an error of* $0.001$. *[Hint: Use Taylor expansion, then use the Alternating Estimation Theorem.]*

**Problem 3.** *Solve the differential equation* $\frac{dy}{dx} = \frac{x^4+1}{x^2y+y^4x^2}$.

**Problem 4.** *Suppose that a population develop according to the logistic equation* $dP/dt = 0.05P - 0.0005P^2$, *where* $t$ *is measured in weeks. (a) What is the carrying capacity? (b) What is the value of* $k$*? (c) What are the equilibrium solutions. (d) If the initial population is* $50$, *what is the population after* $10$ *weeks?*

**Problem 5.** *Solve the first-order linear differential equation* $y' + 2xy = 1$.