**AP Questions Tay/Mac #3** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Maclaurin series for ex is ex =  The continuous function *f* is defined by for x≠1 and *f*(1) = 1. The function *f* has derivatives of all orders at x = 1.

2009 AP Test

1. Write the first four nonzero terms and the general term of the Taylor series for about x = 1.
2. Use the Taylor series found in part (a) to write the first four nonzero terms and the general term of the Taylor series for *f* about x = 1.
3. Use the ratio test to find the interval of convergence for the Taylor series found in part (b).
4. Use the Taylor series for *f* about x = 1 to determine whether the graph of *f* has any points of inflection.

2007 AP Test

Let *f* be the function given by .

1. Write the first four nonzero terms and the general term of the Taylor series for *f* about x = 0.
2. Use your answer to part (a) to find .
3. Write the first four nonzero terms of the Taylor series for about x = 0. Use the first two terms of your answer to estimate .
4. Explain why the estimate found in part (c) differs from the actual value of by less than .

The function *f* is defined by the power series

2006 AP Test

 *f*(x) = 

for all real numbers x for which the series converges. The function *g* is defined by the power series

 *g*(x) = 

for all real numbers x for which the series converges.

1. Find the interval of convergence of the power series for *f*. Justify your answer.
2. The graph of y = f(x) – g(x) passes through the point (0,-1). Find y’(0) and y’’(0). Determine whether *y* has a relative minimum, a relative maximum, or neither at x = 0. Give a reason for you answer.