Due at the beginning of class on the day of Test 3

Direction: Solve the problems in this worksheet on separate sheets of paper. Write your solution neatly. Use standard size paper. Clearly label each problem, and include each problem in the correct order. No ragged edges. Staple multiple pages. At the top of the first page put your name, Math 2414, and the title of the worksheet.Show all work to justify your answer. Answer with insufficient work will receive no credit.

Problem 1: Title of problem

Find the Maclaurin series for the function using the important series:

1. $g(x) = e^{x^2/2}$
2. $h(x) = x^2 \ln(1 + x^3)$
3. $u(x) = \cos(4x)$
4. $v(x) = \sin(\pi x)$
5. $w(x) = xe^{-x}$
6. $z(x) = \dfrac{\arctan x}{x}$

Problem 2: Using the important Maclaurin series

Find the Maclaurin series for the function using the important series:

1. $g(x) = \cos^2 x$
2. $h(x) = \dfrac{1}{2}(e^x - e^{-x})$

Problem 3: Multiply power series

Find the first four nonzero terms of the Maclaurin series for the function

1. $g(x) = e^x \sin x$
2. $h(x) = e^x \arctan x$

Problem 4: Use power series to approximate an integral

Use a power series to approximate the integral with an error of less than 0.0001.

1. $\displaystyle\int_0^1 \frac{\sin x}{x} dx$
2. $\displaystyle\int_0^1 \cos(x^2) dx$

Problem 5: Use the binomial series

Use the binomial series formula to find the Maclaurin series for the given function

1. $f(x) = \sqrt[4]{1 - x}$
2. $g(x) = \dfrac{1}{\sqrt{4 + x^2}}$