ASSIGNMENT 2 **MATHEMATICS 1001** FALL 2019

Due: Friday, September 27th, 2019 at 4:00pm. SHOW ALL WORK.

Note: You are encouraged to complete the WebAssign problem set "Indefinite Integrals by u-Substitution" and the "Worksheet on Integrals Leading to Inverse Trigonometric Functions" before you work on this assignment.

1. Use u-substitution to evaluate the following indefinite integrals.

   (a) $\displaystyle \int \frac{\cot(\ln(x))}{3x}\, dx$

   (b) $\displaystyle \int \left[x^3 \sin(x^4) - \frac{\cos\left(\frac{1}{x^4}\right)}{x^5} \right] dx$

   (c) $\displaystyle \int x^7 \sqrt{x^2 - 3}\, dx$

2. Evaluate each of the following integrals which give rise to inverse trigonometric functions.

   (a) $\displaystyle \int \frac{x^2 + 4}{x\sqrt{x^2 - 4}}\, dx$

   (b) $\displaystyle \int \frac{e^t}{\sqrt{7 - e^{2t}}}\, dt$

3. Use an appropriate method to integrate each of the following rational functions.

   (a) $\displaystyle \int \frac{1}{16x^2 - 24x + 34}\, dx$

   (b) $\displaystyle \int \frac{3x^5 + 10x^3 - 3x^2 - 12}{x^2 + 4}\, dx$

   (c) $\displaystyle \int \frac{20z^3 + 5z}{6z^4 + 3z^2 + 11}\, dz$