# MAC2312: Calculus 2 - Section 3

## Test 1 Review — June 3, 2015

1. Evaluate using integration by parts.
   (a) $\int x^5 \ln x \; dx$
   (b) $\int (x^2+1)e^{-x}$
2. Evaluate the trigonometric integrals.
   (a) $\int \cos\theta \cos^5(\sin\theta) \; d\theta$.
   (b) $\int \sin 8x \;\; \cos 5x \; dx$
3. Evaluate $\int \dfrac{x}{\sqrt{1+x^2}} \; dx$ using trigonometric substitution.
4. Use the formula $\int \sqrt{a^2-u^2} \; du = \dfrac{u}{2}\sqrt{a^2-u^2} + \dfrac{a^2}{2}\sin^{-1}\dfrac{u}{a} + C$ to evaluate $\int x\sqrt{6+4x-4x^2} \; dx$.
5. Write $\dfrac{4x}{x^3+x^2+x+1}$ as a sum of partial fractions and evaluate $\int \dfrac{4x}{x^3+x^2+x+1} \; dx$.
6. Approximate the definite integral $\int_1^3 \ln x \; dx$ using Simpson's Rule with $n = 4$.