Calculus(II)
Homework 1, Mar, 05, 2020
Deadline: Mar, 20, 2020

1. Evaluate the integral.
   (a) $\int x \cos 5x \; dx$.
   (b) $\int ln(2x+1) \; dx$.
2. First make a substitution and then use integration by parts to evaluate the integral.
   (a) $\int \cos \sqrt{x} \; dx$.
   (b) $\int t^3 e^{-t^2} \; dt$.
3. Evaluate the integral.
   (a) $\int_0^{\frac{\pi}{2}} \sin^7 \theta \cos^5 \theta \; d\theta$.
4. Evaluate the integral using the indicated trigonometric substitution. Sketch and label the associated right triangle.
   (a) $\int \frac{dx}{x^2\sqrt{4-x^2}}, \; x = 2\sin\theta$.
5. Evaluate the integral.
   (a) $\int_0^1 \frac{2}{2x^2+3x+1} \; dx$.
6. Determine whether each integral is convergent or divergent. Evaluate those that are convergent.
   (a) $\int_3^\infty \frac{1}{(x-2)^{\frac{3}{2}}} \; dx$.
   (b) $\int_0^\infty \frac{1}{\sqrt[4]{1+x}} \; dx$.
   (c) $\int_{-\infty}^0 \frac{1}{3-4x} \; dx$.