

Math 199, Spring 2022
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2/4/22

Preparation Assignment 3 - Integration techniques

Estimated Time: Less than 30 minutes.

Goals: On Friday, 2/4/22, our goal will be to practice solving integrals. The goal of this assignment is for you to collect various techniques that you know in one place.

1) Substitution: a.k.a. “ u -substitution”; describe the method precisely, and then in your own words.

2) Trig functions:

$$\begin{array}{lll} \int \sin x dx = & \int \cos x dx = & \int \sec x \tan x dx = \\ \int \sec^2 x dx = & \int \csc^2 x dx = & \int \csc x \cot x dx = \end{array}$$

3) Integration by parts: describe the method precisely, and then in your own words.

3.5) Integration by parts replaces one integral with a (hopefully easier) integral. In which types of situations can the “by parts” method still be useful even if the new integral you get is not any easier?

4) Trigonometric substitution: which integrals is this useful for, and what is your general strategy?