Chapter 8. Techniques of Integration

8.1 Basic Integration Formulas

Note. See Table 8.1 on page 554 for a summary of many of the integration formulas we have studied up to this point. We now work a few examples and introduce some *tricks* (OH, I mean *techniques*!).

Example. Page 556 Example 5. Evaluate

$$\int \frac{3x^2 - 7x}{3x + 2}\, dx.$$

Perform long division before integrating.

Example. Page 557 Example 7. Evaluate

$$\int \sec x\, dx.$$

Multiply by $\dfrac{\sec x + \tan x}{\sec x + \tan x}$ before integrating. A similar "technique" can be used to evaluate $\int \csc x\, dx$.

Note. We have (Table 8.2):

$$\begin{aligned}\int \sec u\, du &= \ln|\sec u + \tan u| + C\\ \int \csc u\, du &= -\ln|\csc u + \cot u| + C.\end{aligned}$$

Examples. Page 559 numbers 38, 58, 64, page 560 number 84 and 90.