7.1: Basic Techniques

Basic Integration Formulas-Need to Know by Heart

1) $\int k dx = ...$ **2)** $\int x^m dx = ...$ $(m \neq -1)$ **3)** $\int \frac{1}{x} dx = ...$

4) $\int \cos(x) dx = ...$ **5)** $\int \sin(x) dx = ...$ **6)** $\int \sec^2(x) dx = ...$

7) $\int \sec(x)\tan(x) dx = ...$ **8)** $\int e^x dx = ...$ **9)** $\int \frac{1}{1+x^2} dx = ...$ **10)** $\int \frac{1}{\sqrt{1-x^2}} dx = ...$

Remark1: Combine these rules with the chain rule. Examples:
$\int e^{2x} dx = ...$ $\int \frac{1}{4+9x^2} dx = ...$

Remark2: Remember algebraic tricks such as: completing the square, splitting up fractions, long division of polynomials, conjugation, in addition to subtle substitutions Examples:

$\int \frac{2-3x}{\sqrt{1-x^2}} dx = ...$ $\int \frac{1}{x^2-4x+5} dx = ...$ $\int \frac{x^2+2}{x-1} dx = ...$ $\int \frac{dt}{\sec(t)-1} = ...$