

MATH 3D Prep: Integrals Involving Extra Variable

Facts to Know:

There are two ways to involve an extra variable in integrals:

1. Fundamental Theorem of Calculus Part I: $g(x) = \int_a^x f(t) dt$ satisfies $g'(x) = f(x)$.
2. Extra variable in $f(x)$: $\int_a^b f(x, t) dt$ is a function of _____.

Both of these two types of integrals are used in Math 3D.

Examples:

1. Find a function $g(x)$ such that $g'(x) = e^{x^2}$ and $g(2) = e^4$

2. Evaluate $\int_0^1 te^{-xt} dt$.