

Math 103 Day 16: Antiderivatives

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Outline

1 Antiderivatives

Definition

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Theorem

If F is an antiderivative of f on an interval I , then the most general antiderivative of f on I is

$$F(x) + C$$

where C is an arbitrary constant.

Given $F' = f$ and $G' = g$

Function	Particular Antiderivative
$cf(x)$	$cF(x)$
$f(x) + g(x)$	$F(x) + G(x)$
$x^n \quad n \neq 1$	$\frac{x^{n+1}}{n+1}$
$\cos(x)$	$\sin(x)$
$\sin(x)$	$-\cos(x)$
$\sec^2(x)$	$\tan(x)$
$\sec(x)\tan(x)$	$\sec(x)$

Example

Show that for motion in a straight line with constant acceleration a , initial velocity v_0 and initial displacement s_0 , the displacement after time t is given by

$$S(t) = \frac{1}{2}at^2 + v_0t + s_0$$