

MathsC 207 Multivariable Calculus

Find the antiderivative:

$$\int (2x - 7x^5) dx$$

1) Rules on pg. 161 in lecture guide:

Simple Antiderivative Rules

Rule:	Function:	Antiderivative:
Constant	$f(x) = k$	$\int k dx = kx + C$
<u>Simple Power</u>	$f(x) = x^n, n \neq -1$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$
x^{-1} or $1/x$	$f(x) = x^{-1} = 1/x$	$\int x^{-1} dx = \int 1/x dx = \ln x + C$
Exponential	$f(x) = b^x, b > 0$	$\int b^x dx = b^x / \ln b + C$
e^x	$f(x) = e^x$	$\int e^x dx = e^x + C$
e^{kx}	$f(x) = e^{kx}$	$\int e^{kx} dx = e^{kx} / k + C$

2) What rule applies to our problem? Simple Power

$$3) \text{ Solve: } \frac{2x^{1+1}}{1+1} - \frac{7x^{5+1}}{5+1} + C$$

$$\text{Simplifies: } \frac{2x^2}{2} - \frac{7x^6}{6} + C$$

• Tips: * Remember to add "C" at the end because this is a general antiderivative.

* You can check your answer by taking the derivative of the antiderivative the derivative should be your original problem.