Section 4.9: Antiderivatives

(1) In this section, we learn about antiderivatives. What is an antiderivative of a function?

(2) Does a function have more than one antiderivative? Why? What is the "most general antiderivative?"

(3) For each function below, write its antiderivative. For the functions f and g, use F and G, respectively, to represent their antiderivatives.

Function	Most General Antiderivative	Explain in words
$cf(x)$		
$f(x) + g(x)$		
$x^n (n \neq -1)$		
$\dfrac{1}{x}$		
e^x		
b^x		
$\cos(x)$		
$\sin(x)$		
$\sec^2(x))$		
$\sec x \tan x$		
$\dfrac{1}{\sqrt{1-x^2}}$		
$\dfrac{1}{1+x^2}$		

(4) If we are given $f'(x)$, how can we find f? Do we need any additional information to find f exactly? Why?

(5) What is the antiderivative of velocity? Of acceleration? Why?

Extra Practice in Book: 4.9: 5, 9, 15, 17, 25, 33, 41, 51, 55, 68,