5.2 Day 2

Monday, October 31, 2016 1:15 PM

Antiderivatives

Given $f(x)$ find $f'(x)$:

a. $f(x) = x^2 - 5$ b. $f(x) = \pi + x^2$ c. $f(x) = x^2 - \frac{1}{2}$

$f'(x) = 2x$

what if given $f'(x) = 2x$ find $f(x) = x^2 + C$ ← constant

$f'(x) = x^3$ $f(x) = \frac{1}{4}x^4 + C$

$f'(x) = 2x^5$ $f(x) = \frac{2}{6}x^6 + C$ or $\frac{1}{3}x^6 + C$

1. Add one to the power
2. Divide by the 'new' power
3. Add C

n = constant C = constant

$f'(x) = x^n$

$f(x) = \frac{x^{n+1}}{n+1} + C$

find $f(x)$ given $f'(x)$

a. $f'(x) = 2x^6 + x$ $f(x) = \frac{2x^7}{7} + \frac{x^2}{2} + C$

b. $f'(x) = \sqrt{x} + 3 = x^{1/2} + 3x^0$ $f(x) = \frac{2}{3}x^{3/2} + 3x + C$

c. $f'(x) = \cos x$ $f(x) = \sin x + C$

d. $f'(x) = \frac{1}{x} = x^{-1}$ $f(x) = \ln x + C$

e. $f'(x) = \frac{1}{x^2} = x^{-2}$ $\quad f(x) = -x^{-1} + C$

Find the function w/ the given derivative whose graph passes through the point P.

$f'(x) = \frac{1}{x^2}$ where $x > 0$ $\quad P(2,1)$ $\quad x, f(x)$

$f(x) = -x^{-1} + C$

$1 = -(2)^{-1} + C$

$1 = -\frac{1}{2} + C$

$C = \frac{3}{2}$

$f(x) = -x^{-1} + 3/2$