

# 8.1 Antiderivatives

Wednesday, June 12, 2019 7:14 AM

constant of integration  
↓  
C

A  
I  
N  
T  
E  
R  
D  
E  
R  
I  
V  
E

D  
E  
R  
I  
V  
E

Anti-Derivative:  $F(x) = x^3 - 2x^2 + 5x + C$

Function:  $f(x) = 3x^2 - 4x + 5$

1<sup>st</sup> Derivative:  $f'(x) = 6x - 4$

2<sup>nd</sup> Derivative:  $f''(x) = 6$

$f(x) = 4x^3 - x^2 + 7x + 3$

$f'(x) = 12x^2 - 2x + 7$

$f(x) = 4x^3 - x^2 + 7x + C$

## POWER RULE DERIVATIVE:

- ① Multiply exponent by coefficient
- ② Subtract 1 from exponent

## "REVERSE" POWER RULE:

- ① Add 1 to exponent
- ② Divide coefficient by new exponent
- ③ +C at the end

ex  $f(x) = 5x^3 - 8x + 10$

$F(x) = \frac{5}{4}x^4 - 4x^2 + 10x + C$

DERIVE

"REVERSE" POWER RULE:  $\#x^n \rightarrow \frac{\#}{n+1}x^{n+1} + C$

ex  $f(x) = 4\sqrt{x} + \frac{3}{x^2}$

REWRITE:  $f(x) = 4x^{1/2} + 3x^{-2}$

$F(x) = \frac{8}{3}x^{3/2} - 3x^{-1} + C$

$$F(x) = \frac{8}{3}x^{7/2} - 3x^{-1} + C$$