

# LESSON 6.1: *Antiderivatives*

<b>WARM UP</b>	<p>Differentiate each of the following functions.</p> <p>1. <math>f(x) = x^4</math>                      2. <math>f(x) = x^4 + 7</math>                      3. <math>f(x) = x^4 - 8</math></p> <p>Notice, each of the above derivatives are _____ .</p> <p>This means, when finding the antiderivative of a function, you must take this into account.</p> <p>With that in mind, what do you get when you antidifferentiate <math>f'(x) = 4x^3</math>?</p>
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<b>ANTIDERIVATIVES</b> <i>(integrals)</i>	$\int f'(x) dx = f(x) + C$	
	<b>Integration Rules</b>	
	Power Rule	
	Constant Rule	
	Scalar Multiple Rule	
	Sum Rule	
	Trig Rules	

**ANTIDERIVATIVES**  
(integrals)

**Examples:** Evaluate (Integrate).

1.  $\int x^2 dx$

2.  $\int 2t^2 + 3t - 8 dt$

3.  $\int 8 dx$

4.  $\int \frac{4}{x^2} - \frac{4}{\sqrt[3]{x}} dx$

5.  $\int y^5 - 7 dy$

6.  $\int \frac{x^3 - \sqrt{x}}{x} dx$

7.  $\int 2 \sin(\theta) + 4 \cos(\theta) d\theta$

8.  $\int \frac{\cos(x)}{\sin^2(x)} dx$