IBDP Mathematics Analysis and approaches (SL) Integration rules



Integration rules

Reverse of differentiation

Find the derivative of $f(x) = x^3$ and $f(x) = x^3 + 10$.



Indefinite integral:

$$\int f'(x) \, dx = f(x) + C$$

C is constant.

Derivative of a constant is 0.

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

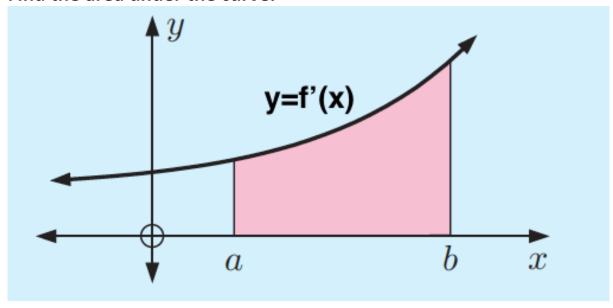
2. Find ∫	$5x^6 +$	20 dx.
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Definite integral:

$$\int_a^b f'(x)\,dx$$

Find the area under the curve.



The area below the curve between the line x = b and x = a.

$$\int_{a}^{b} f'(x) dx$$

$$= [f(x)]_{a}^{b}$$

$$= f(b) - f(a)$$



. Find the a $x = 3$.	rea between x-axis and $f(x) = x^4$ from $x = 1$ to
– 3.	
. Find the a	Tea between x-axis and $f(x) = -x^2 + 4x + 2$ from
	rea between x-axis and $f(x) = -x^2 + 4x + 2$ from 2.
Find the a $x = 0$ to $x = 0$	



Paper 1

1. Let $f'(x) = 12x^2 - 2$. Given that $f(-1) = 1$, find $f(x)$.				
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2. 🖲	Let $f'(x) =$	$=6x^2-5.6$	Given that f	f(2) = -3, 1	find $f(x)$.	



Paper 2

1. A gradient function is given by $\frac{dy}{dx} = 10e^{2x} - 5$. When $x = 0$, $y = 8$. Find the value of y when $x = 1$.				

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- 2. Let $f(x) = \sqrt[3]{x^4} \frac{1}{2}$.
- (a) Find f'(x).
- (b) Find $\int f(x)dx$.