Calc12 Date:_____

Mr. C. Sdoutz

Unit 4: Integration
4.5 Fundamental Theorem of Calculus

The Fundamental Theorem of Calculus

If a function f is continuous on $[a, b]$ and F is an antiderivative of f (ie. $F' = f$) on $[a, b]$ then

$$\int_a^b f(x)\,dx = F(b) - F(a)$$

ie. Use the antiderivative of f to evaluate the definite integral instead of using the Riemann sum limit.

ex.

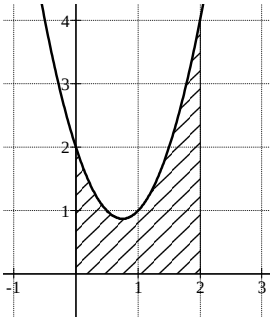
$\int_1^3 3x^2\,dx$

ex.

$\int_1^2 (x^2 - 3)\,dx$

Now we can also find the area under a curve much simpler.

ex. Find the area of the region bounded by $f(x) = 2x^2 - 3x + 2$, $y = 0$ (ie. the x-axis), $x = 0$ and $x = 2$.



Practice Questions

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