

Antiderivatives

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ES: If given $f'(x)$, how do I get $f(x)$?

(ex1) If $f'(x) = 3x^2$, what is $f(x)$?

$$f(x) = x^3$$

(ex2) If $f'(x) = 8x^3$, what is $f(x)$?

$$f(x) = 2x^4$$

(ex3)

$$f(x) = x^3 + 5$$

$$f'(x) = 3x^2$$

So, if $f'(x) = 3x^2$, what is $f(x)$?

$$f(x) = x^3 + C, \text{ where } C \text{ is a constant}$$


Are we missing anything?

Definition

A function F is an antiderivative of f on an interval I when $F'(x) = f(x)$ for all x in I .

Summary

Find the original function $F(x)$
(Antiderivative)



a) $f(x) = 6x^2$

b) $f(x) = 20x^3 + 4$

c) $f(x) = 3x^5 - 2x$