

(Please Grab a Chrome Book)

Objective: You will be able to:

- find the derivative using the Power Rule
- find the derivative of six trig functions
- find the derivative using Product Rule

Stand and Deliver

Calculus the Musical: Power Rule

2.2

Power Rule to find a derivative

$$\frac{d}{dx}[x^n] = nx^{n-1}$$

you say "n times x to the n -1"

Stand and Deliver

Derivative of Trig. Functions 2.2/2.3

$$\frac{d}{dx} [\sin x] = \cos x$$

$$\frac{d}{dx} [\tan x] = \sec^2 x$$

$$\frac{d}{dx} [\cos x] = -\sin x$$


$$\frac{d}{dx} [\cot x] = -\csc^2 x$$


$$\frac{d}{dx} [\sec x] = \sec x \tan x$$

$$\frac{d}{dx} [\csc x] = -\csc x \cot x$$

kahoot power rule

≈ 10 min

 <https://play.kahoot.it/#/?quizId=94415607-5ee5-4c08-a163-c5b8085f58ef>

 <https://create.kahoot.it/#quiz/94415607-5ee5-4c08-a163-c5b8085f58ef>

Stand and DeliverProduct Rule

2.3

$$\frac{d}{dx} [f(x)g(x)] = [f(x)g'(x) + g(x)f'(x)]$$

"first times derivative of the second plus
second times the derivative of the first"

1d2+2d1

Examples

1. $f(x) = (3x)(x^2 + 1)$

one option (distribute and use power rule)

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

$$f'(x) = 9x^2 + 3$$

another option (product rule)

1. $f(x) = (3x)(x^2 + 1)$

$$f'(x) = 3x(2x) + (x^2 + 1)(3)$$

$$= 6x^2 + 3x^2 + 3$$

$$f'(x) = 9x^2 + 3$$

Examples

2. $f(x) = x \cos x$

$$\begin{array}{l} X \cdot -\sin x \\ \cancel{X \cdot \sin x} \end{array}$$

no choice, must use product rule

$$\begin{aligned} f'(x) &= x(-\sin x) + \cos x(1) \\ &= -x \sin x + \cos x \end{aligned}$$

kahoot product

≈ 5 min

<https://play.kahoot.it/#/?quizId=4ae3cd7d-5e37-4d54-a24c-c9c13bd870c4>

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