

ADE DLC Calculus for Everyone
The Chain Rule---1

The Chain Rule

$$\frac{d}{dx}[f(u)] = f'(u)u'$$

say it in your own words...

ADE DLC Calculus for Everyone
The Chain Rule---1

The Chain Rule—

$$\frac{d}{dx}[f(u)] = f'(u)u'$$

“Derivative of the outside times
derivative of the inside”

ADE DLC Calculus for Everyone
The Chain Rule---2

What is the derivative of

$$y = (3x + 2)^2 ?$$

ADE DLC Calculus for Everyone
The Chain Rule---2

$$\begin{aligned}y' &= 2(3x + 2)^1(3) \\ &= 6(3x + 2) \\ &= 18x + 12\end{aligned}$$

ADE DLC Calculus for Everyone
The Chain Rule---3

What is the derivative of

$$y = \sin(6x) \quad ?$$

ADE DLC Calculus for Everyone
The Chain Rule---3

$$\begin{aligned}y' &= \cos(6x) \cdot 6 \\ &= 6\cos(6x)\end{aligned}$$

ADE DLC Calculus for Everyone
The Chain Rule---4

What is the derivative of

$$y = \tan(x^2) \quad ?$$

ADE DLC Calculus for Everyone
The Chain Rule---4

$$\begin{aligned}y' &= \sec(x^2) \tan(x^2) \cdot 2x \\ &= 2x \sec(x^2) \tan(x^2)\end{aligned}$$

ADE DLC Calculus for Everyone
The Chain Rule---5

What is the derivative of

$$y = \sqrt{x^2 - 3x + 5} \quad ?$$

ADE DLC Calculus for Everyone
The Chain Rule---5

$$\begin{aligned}y &= (x^2 - 3x + 5)^{\frac{1}{2}} \\ y' &= \frac{1}{2}(x^2 - 3x + 5)^{-\frac{1}{2}}(2x - 3) \\ &= \frac{(2x - 3)}{2(x^2 - 3x + 5)^{\frac{1}{2}}}\end{aligned}$$

