

Calculus I

Derivatives and rational exponents

Todor Milev

2019

Example (Power Rule, negative exponent)

Differentiate $y = \frac{1}{x}$.

Example (Power Rule, negative exponent)

Differentiate $y = \frac{1}{x}$.

$$y = x^{-1}.$$

Example (Power Rule, negative exponent)

Differentiate $y = \frac{1}{x}$.

$$y = x^{-1}.$$

Power Rule: $\frac{dy}{dx} = ?$

Example (Power Rule, negative exponent)

Differentiate $y = \frac{1}{x}$.

$$y = x^{-1}.$$

Power Rule: $\frac{dy}{dx} = (-1)x^{-2}$

Example (Power Rule, negative exponent)

Differentiate $y = \frac{1}{x}$.

$$y = x^{-1}.$$

Power Rule: $\frac{dy}{dx} = (-1)x^{-2}$

$$= -\frac{1}{x^2}.$$

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

$$y = x^{\frac{5}{6}}.$$

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

$$y = x^{\frac{5}{6}}.$$

Power Rule: $\frac{dy}{dx} = ?$

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

$$y = x^{\frac{5}{6}}.$$

Power Rule: $\frac{dy}{dx} = \frac{5x^{-\frac{1}{6}}}{6}$

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

$$y = x^{\frac{5}{6}}.$$

Power Rule: $\frac{dy}{dx} = \frac{5x^{-\frac{1}{6}}}{6}$
 $= ?$

Example (Power Rule, fractional exponent)

Differentiate $y = \sqrt[6]{x^5}$.

$$y = x^{\frac{5}{6}}.$$

Power Rule: $\frac{dy}{dx} = \frac{5x^{-\frac{1}{6}}}{6}$
 $= \frac{5}{6\sqrt[6]{x}}.$