

# Calculus I

## Derivatives and rational exponents

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

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

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