

Exercise 1

If V is the volume of a cube with edge length x and the cube expands as time passes, find dV/dt in terms of dx/dt .

Solution

The volume of a cube with edge length x is

$$V = x^3.$$

Differentiate both sides with respect to t , using the chain rule on the right side.

$$\frac{d}{dt}(V) = \frac{d}{dt}(x^3)$$

$$\frac{dV}{dt} = (3x^2) \cdot \frac{dx}{dt}$$