

## Answer on Question 68603, Physics, Other

### Question:

A dimension of a cube is increases at the rate of  $3 \text{ cm/s}$ . When the length of the dimension is  $10 \text{ cm}$  then what is the rate of increase the volume of cube?

### Solution:

Let the length of the dimension of the cube is  $x$ . Then, we can write the formula for the volume of the cube:

$$V = x^3.$$

Let's differentiate this equation with respect to the time  $t$ :

$$\frac{dV}{dt} = 3x^2 \frac{dx}{dt},$$

here,  $\frac{dV}{dt}$  is the rate of change of the volume of the cube,  $\frac{dx}{dt}$  is the rate of the length of the dimension.

Then, we get:

$$\frac{dV}{dt} = 3 \cdot (10 \text{ cm})^2 \cdot 3 \frac{\text{cm}}{\text{s}} = 900 \frac{\text{cm}^3}{\text{s}}.$$

### Answer:

$$\frac{dV}{dt} = 900 \frac{\text{cm}^3}{\text{s}}.$$

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