Answer to Question #86490 – Math – Calculus

Question

The length of a rectangle is increasing at a rate of 4 cm/s and its width is increasing at a rate of 5 cm/s. When the length is 11 cm and the width is 7 cm, how fast is the area of the rectangle increasing?

Solution

Let the length of the rectangle be x and the width be y.

Then the area is $A = xy$

Given that,

$\frac{dx}{dt} = 4; \frac{dy}{dt} = 5$

Differentiating area A wrto time t we get,

$\frac{dA}{dt} = \frac{d}{dt}(xy)$

$\frac{dA}{dt} = y\frac{dx}{dt} + x\frac{dy}{dt}$

Given that, $x = 11$ and $y = 7$

Then we get,

$\frac{dA}{dt} = 7(4) + 11(5)$

$\frac{dA}{dt} = 28 + 55$

$\frac{dA}{dt} = 83$

Hence the area is increasing at the rate of 83 cm^2/s.

Answer: 83 cm^2/s.