

Answer to Question#39138, Math, Differential Calculus

A rectangular garden measuring 'x' meters by 'y' meters has an area of 50 m^2 . A fence is built around the garden that is larger by 2.0 m top and bottom and 4 m on either side. What are the dimensions of the new, larger rectangular fence line.

Solution:

$$S_g = 50 \text{ m}^2 = x * y$$

Where: x – width, y – length.

Fence's width (new) is $x + 8$ and length is $y + 4$. If this is proportional to the dimensions of the garden:

$$\frac{x}{x + 8} = \frac{y}{y + 4} \Rightarrow xy + 4x = xy + 8y \Rightarrow 4x = 8y \Rightarrow x = 2y$$

So

$$2y^2 = 50 \Rightarrow y = 5 \text{ and } x = 10$$

The dimensions of the fence:

$$S_f = (x + 8) * (y + 4) = (10 + 8) * (5 + 4) = 18 * 9 = 162 \text{ m}^2$$