Answer on Question #83811 – Math – Calculus

Question

A hypothetical square grows so that the lengths of its diagonals are increasing at a rate of 4 m/min. How fast is the area of the square increasing when the diagonals are 2 m each?

Solution

The diagonal c of the square is related to its side a by the Pythagoras theorem $2a^2 = c^2$. The area then is $A = a^2 = c^2/2$. Differentiating this with respect to time, we obtain $\dot{A} = c\dot{c}$. Given that c = 2 m and $\dot{c}$ = 4 m/min, we obtain $\dot{A} = 8\,m^2/min$.

Answer: 8 m²/min.