Answer on Question #56664 – Math – Algebra

A contractor needs to order the glass for a window. The window is in the shape of an isosceles triangle and the height of the window is 2.5 times the base width. If the width of the base must be 85 cm, what is the largest window area the contractor can use?

Solution

Let x be the width of the base of triangle, $x > 0$. Then $h = 2.5 * x$ is its height.

The area of the triangle is equal to: $S(x) = \frac{1}{2} * 2.5x * x = 1.25x^2$.

$S'(x) = 2.5x > 0$ and function is continuous and differentiable functions when $x > 0$.

Then $S(x)$ is increasing when $x > 0$. The more is x, the more is $S(x)$.

And, when $x = 85\ cm$, $S(x) = 1.25 * 85^2 = 9031.25\ \ cm^2$.

Answer: the largest windows area is $9031.25\ \ cm^2$.