11. [8 points] Jose is building a pyramid-shaped hat with 4 triangular sides of the same shape. Each side has a base of $2x$ centimeters. The height of the hat is $L$ centimeters. Each of the four triangular sides has height $M$ centimeters (see the diagram below).

![Diagram of a pyramid hat with base $2x$ and height $L$, showing the height $M$ of each triangular side.]

a. [3 points] Jose plans to use 400 square centimeters of material in the construction of the hat. Find a formula for the height $L$ of the hat only in terms of $x$. *Your formula should not include the letter $M*.

**Answer:** $L(x) =$

b. [2 points] The volume of a pyramid is given by $V = \frac{1}{3}Ah$, where $A$ is the area of the base and $h$ is the height of the pyramid. Find a formula for the volume of the hat $V$, in cubic centimeters, in terms only of the variable $x$. *Your answer should not include the variables $L$ and/or $M*.

**Answer:** $V(x) =$

c. [3 points] What is the domain of the function $V(x)$ in the context of this problem?

**Answer:**