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MA 158

Examples for 8/26

**Example 1.** The function $C(x) = x^2 - 6x + 39$ models the cost, in hundreds of dollars, to produce $x$ thousand Everlasting Gobstoppers. Find the cost to produce $128,000$ Everlasting Gobstoppers.

**Example 2.** A box is to be constructed from a square piece of cardboard measuring 20 inches by 20 inches by cutting out squares from each corner of length $x$.

(a) Find an equation for the volume $V$ of the box in terms of $x$.

(b) Find an equation for the surface area $S$ of the box in terms of $x$.
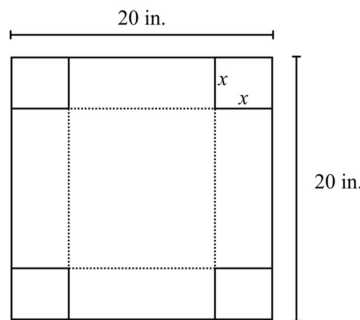


**Example 3.** A field along a river is to be fenced in using 1250 feet of fencing, where no fencing is to be used along the side with the river. (The fenced-in area is rectangular.)

(a) Express the length $l$ of the enclosed field as a function of its width $w$ (where $l$ is parallel to the river).

(b) Express the area $A$ of the enclosed field as a function of the width of the fencing.

**Example 4.** A closed tin can is to hold 350 cm$^3$. If the cost of the material to make the top and bottom costs \$0.75 per square centimeter and the cost to make the side is \$0.55 per square centimeter, find a function to represent the cost $C$ of producing a can in terms of the radius $r$ of the can.

**Example 5.** An animal pen with an area of 400 ft$^2$ is to be evenly subdivided into 12 sections as shown below. Express the total length $L$ of fencing needed as a function of $x$.