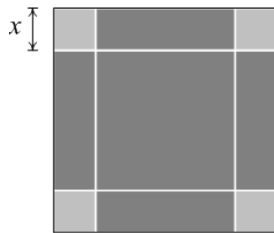
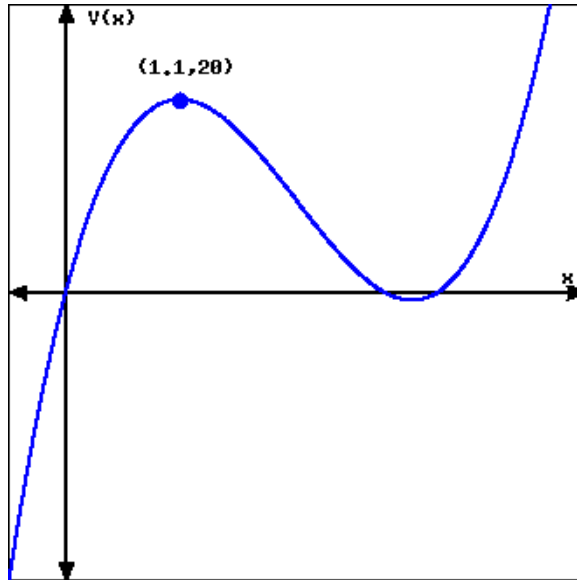
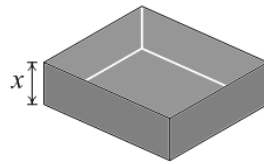


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Problem 1



1



2

A(n) 7 in \times 6 in piece of cardboard has squares cut out of each corner in order to make a box (see Figure 1). Let x represent the length of a cut-out square (the height of the box).

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

$$V(x) = \underline{\hspace{2cm}}$$

(b) Find the domain of the function. Write your answer as a compound inequality involving x .

$$\text{Domain of } V(x): \underline{\hspace{2cm}}$$

(c) Using the graph of $V(x)$ shown in Figure 2, determine the dimensions that yield the maximum volume. Round your answers to the nearest tenth.

Height: in

Width: in

Length: in

Help: [Click here for help entering formulas](#) or [click here for help entering inequalities](#).
It does not matter which side you choose to be the width or length of the box.

Problem 2

A circular oil slick is expanding with radius, r in feet, at time t in hours given by $r = 6t - 0.3t^2$, for t in hours, $0 \leq t \leq 10$.

Find a formula for $A = f(t)$, the area of the oil slick as a function of time.

$A = f(t) =$ _____ help (formulas) with help (units)
(Be sure to include units!)

Problem 3

Consider a firm that produces fans. The table below gives the total cost of producing a given number of fans per day. Suppose that the market price for fans is 12\$. How many fans should the firm produce per day? _____.

Fans produced per day	0	1	2
3	4	5	6
7	8	9	10
Total Cost	0	1	3
8	15	24	35
47	70	84	100