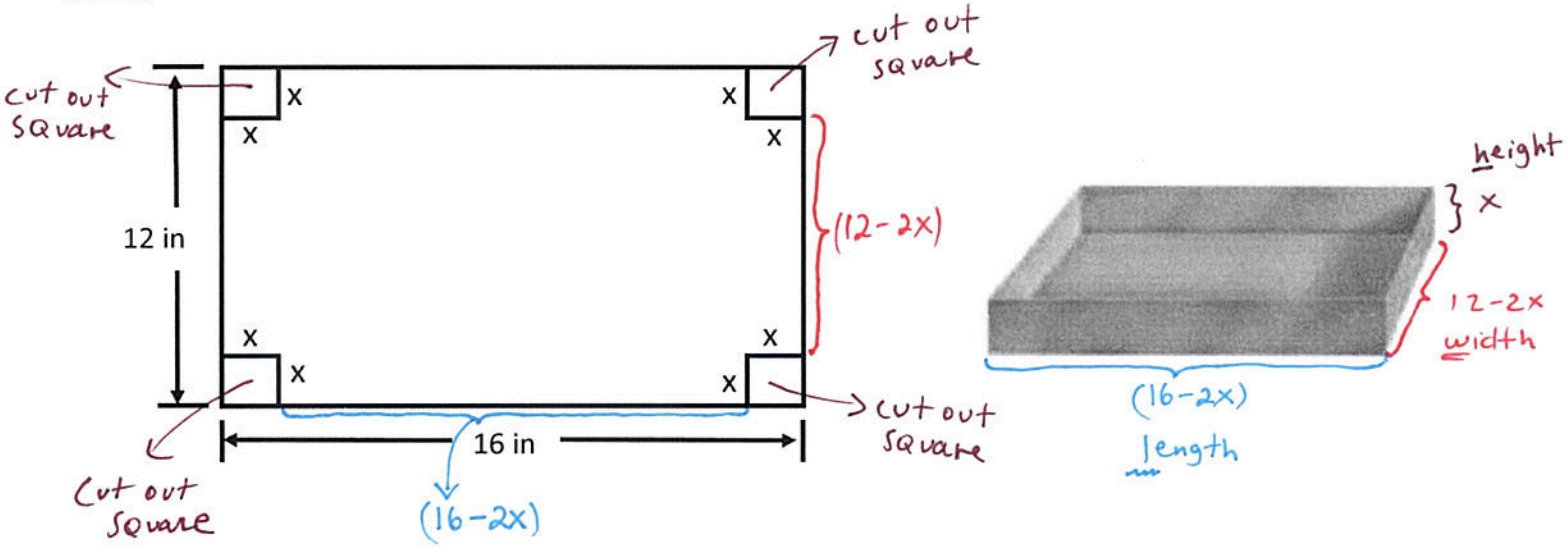
Honors Advanced Algebra
Target 2F

DATE 10/14

A metalworker wants to make an open box from a sheet of metal, by cutting equal squares from each corner as shown.




a. Write expressions that will represent the length, width, and height of the open box.

L = $(16-2x)$ W= $(12-2x)$ H= $x$

b. Use your expressions from part (a) to write a function in factored form for the volume of the box.

$f(x) = x(16-2x)(12-2x)$

RECALL: Volume = $\ell \cdot w \cdot h$

c. Draw the graph of the function.

$f(x) = x(16-2x)(12-2x)$

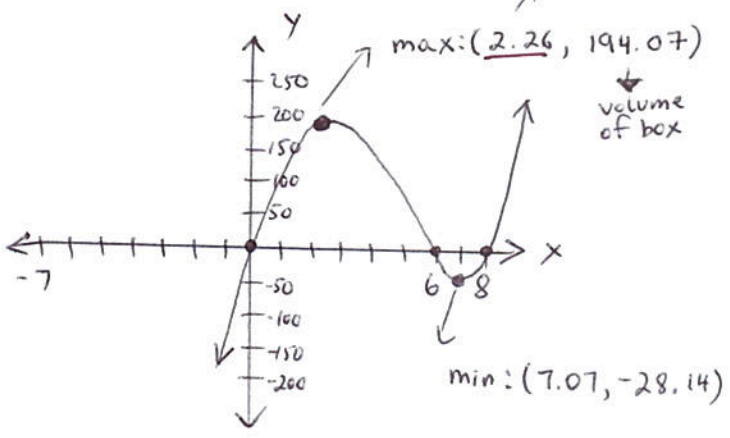
$0 = x(16-2x)(12-2x)$

$0 = x$ or $16-2x=0$ or $12-2x=0$

$+2x \quad +2x$ $\quad$ $+2x \quad +2x$

$\frac{16}{2} = \frac{2x}{2}$ $\quad$ $\frac{12}{2} = \frac{2x}{2}$

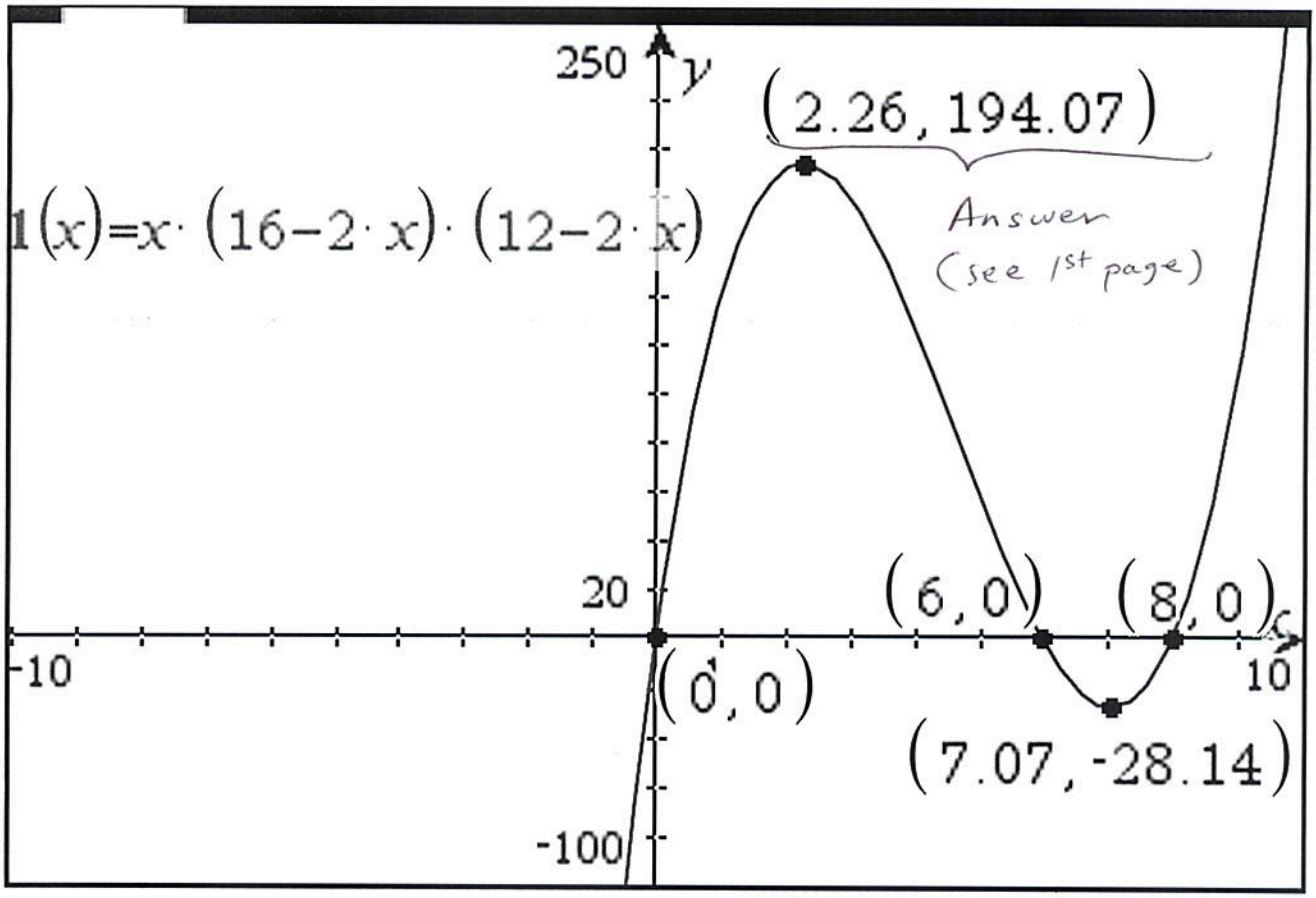
$8 = x$ or $6 = x$




d. Find the maximum volume of the box and the side length of the cut out squares that generate this volume. Round answers to the nearest hundredth.

- The maximum volume of the box is $194.07 \text{ in}^3$. (see graph)
- The side length of the the cut out squares that generates this volume is 2.26 in.

Problem 1


250
y
(2.26, 194.07)
Answer
(see 1st page)
1(x)=x·(16−2·x)·(12−2·x)
20
(6, 0)
(8, 0)
x
-10
10
(0, 0)
(7.07, -28.14)
-100