Algebra II
Lesson #2 Unit 8
Class Worksheet #2
For Worksheet #5 - #8

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All of the problems in the second part of this unit involve problems like this. They require the creation and application of a second degree function for the 'quantity' that we wish to maximize (or minimize), in this case the area of a rectangle.

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Add -2x to each side.

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Divide each side by 3.

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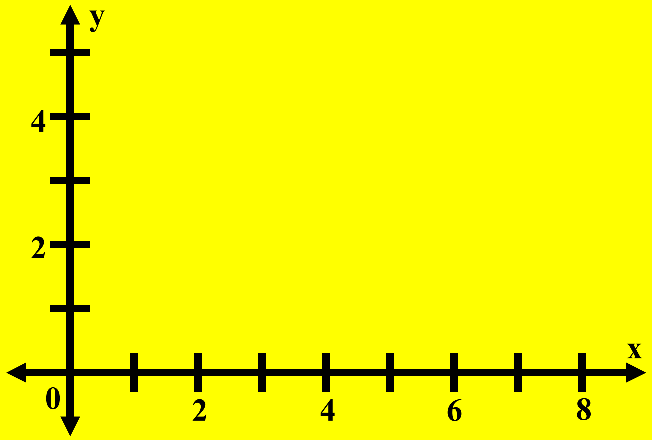

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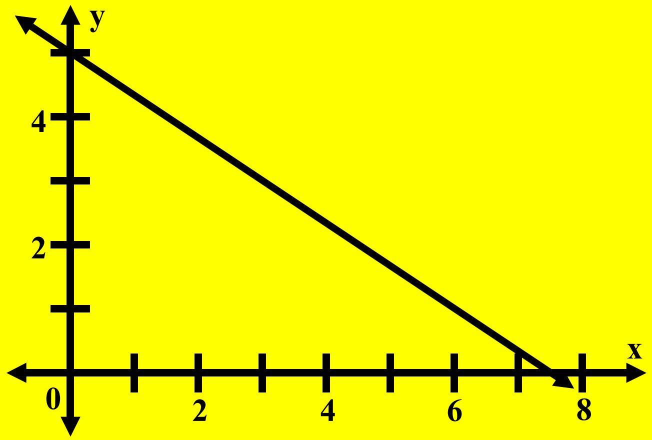

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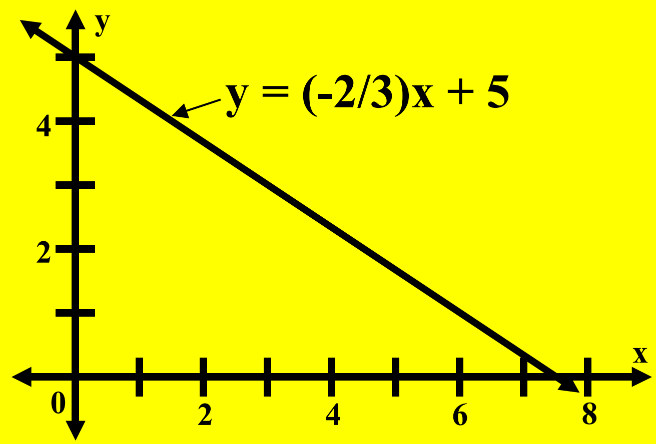

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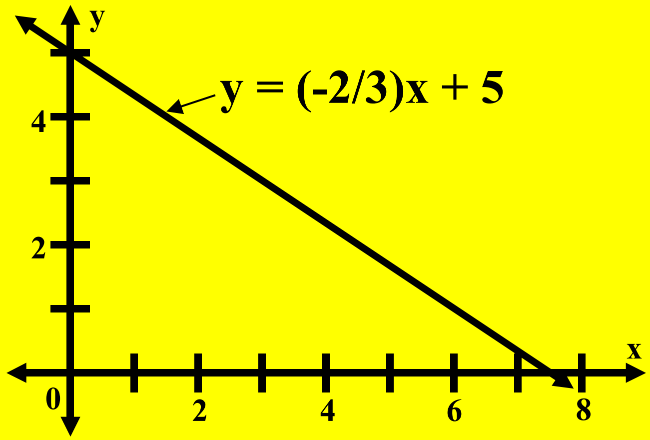

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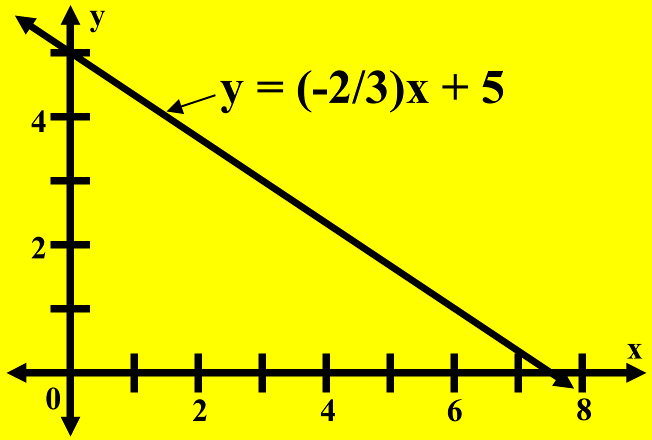

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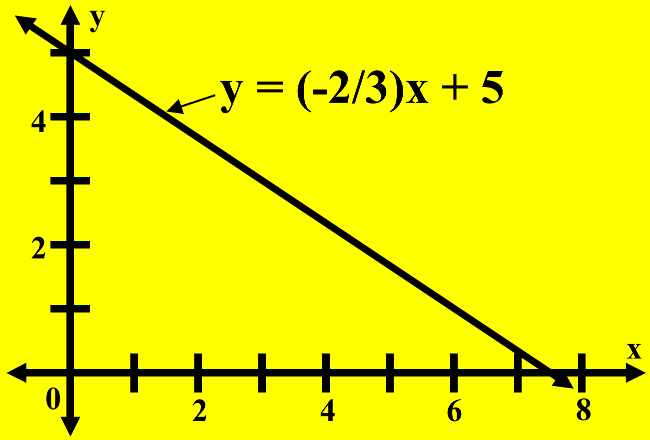

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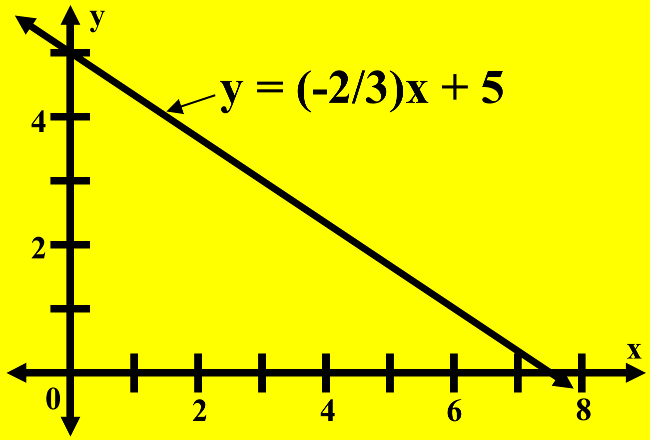

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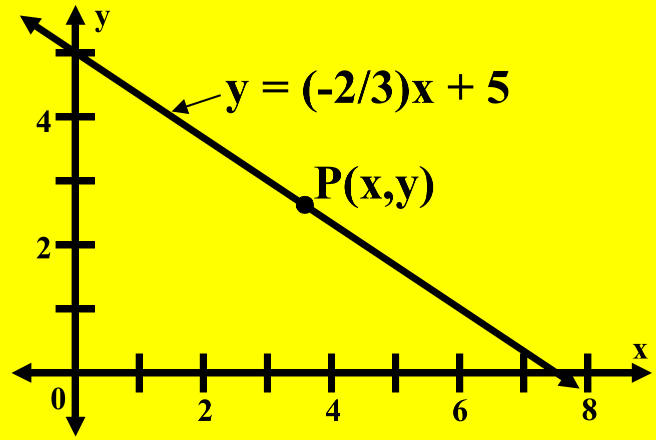

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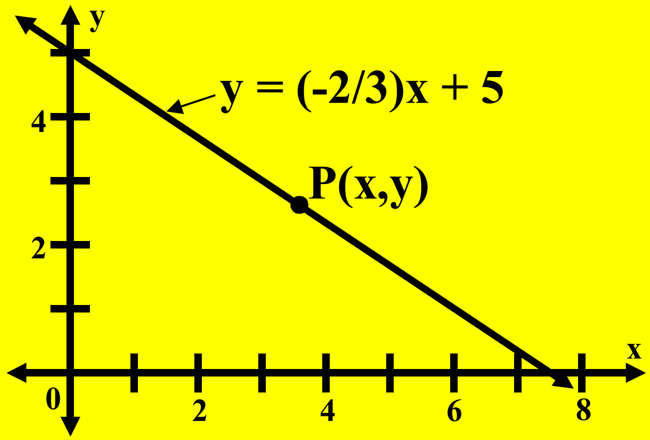

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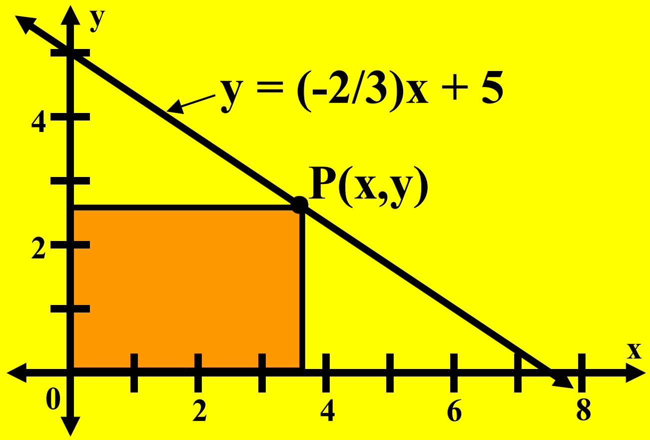

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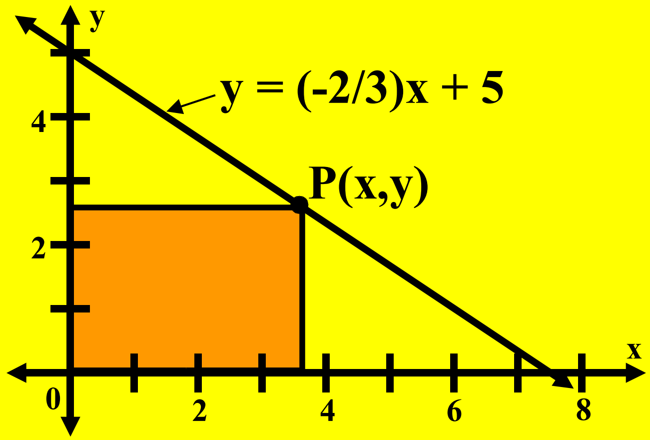

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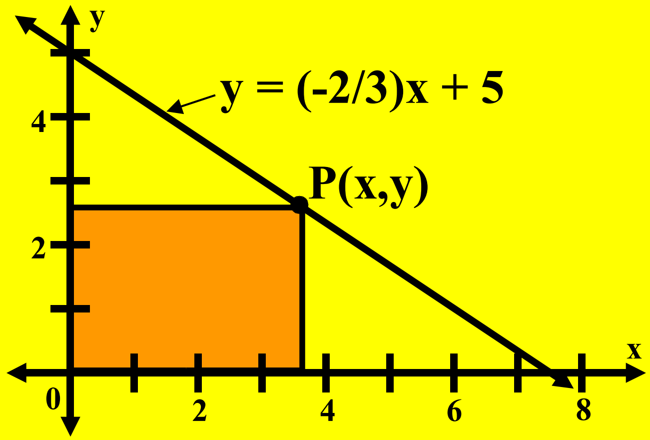

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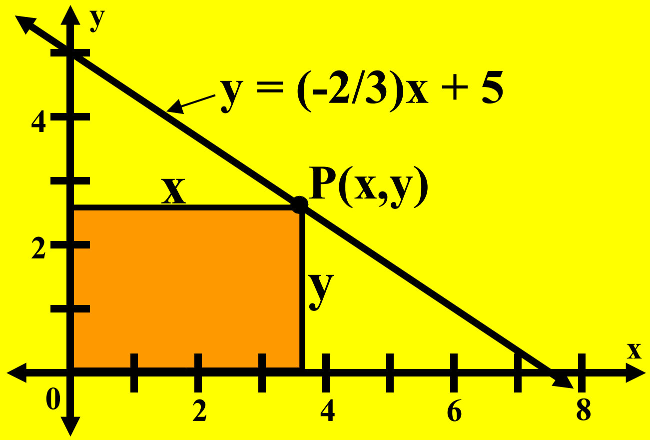

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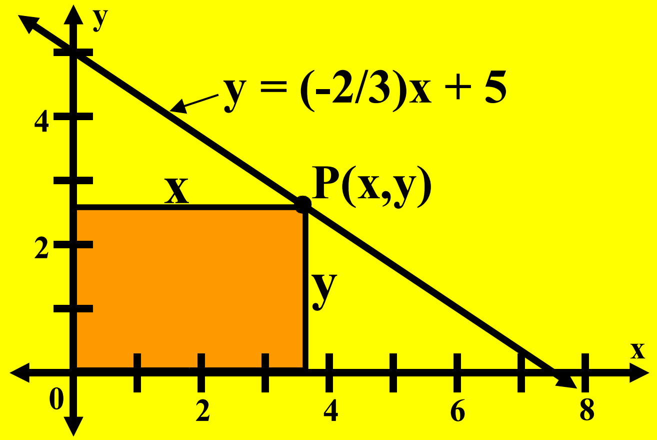

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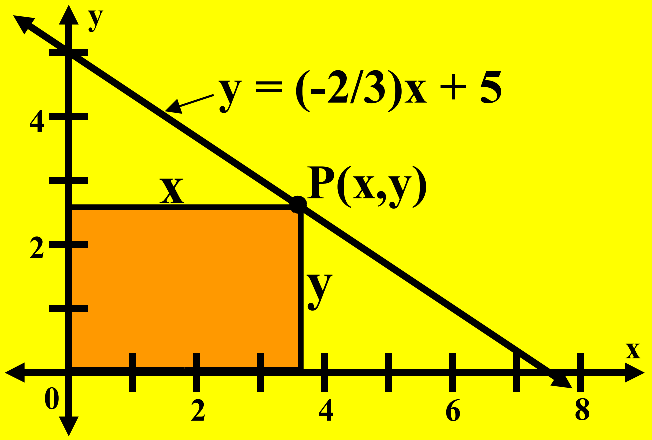

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Now, we can express the area of the rectangle as a function of x.

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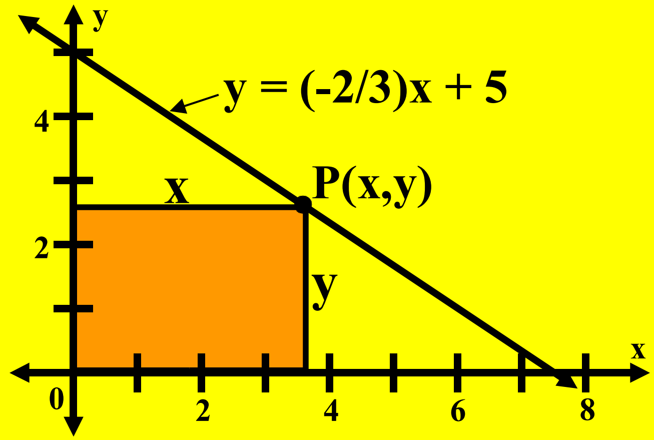

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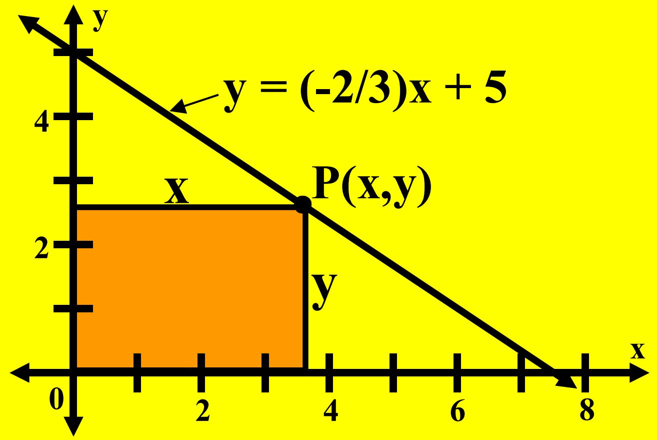

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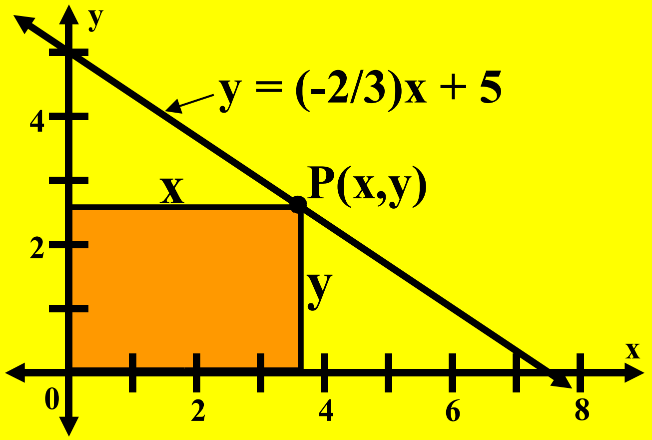

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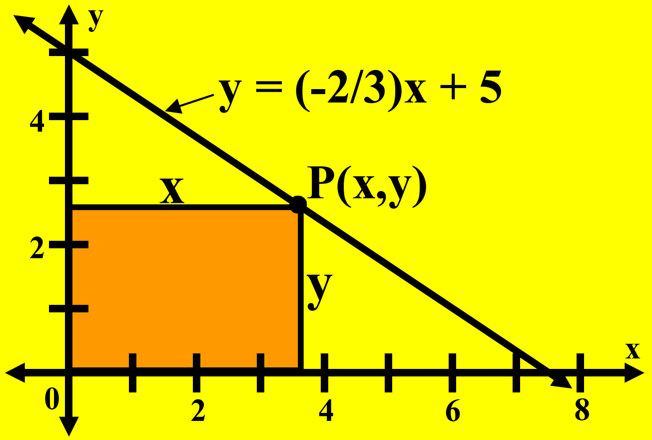

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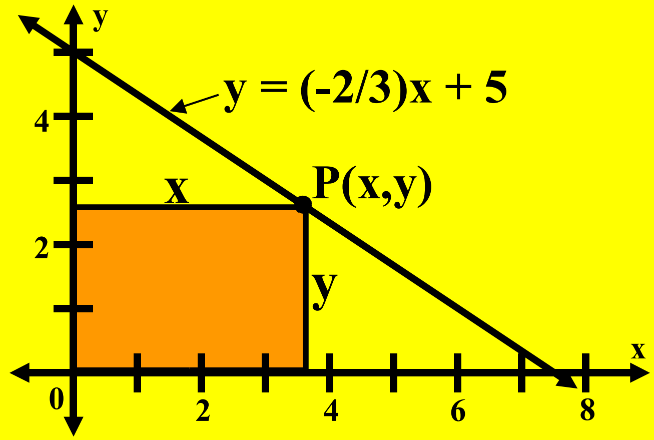

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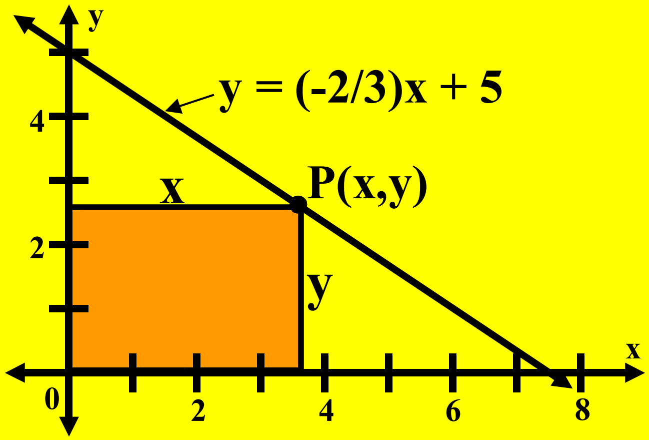

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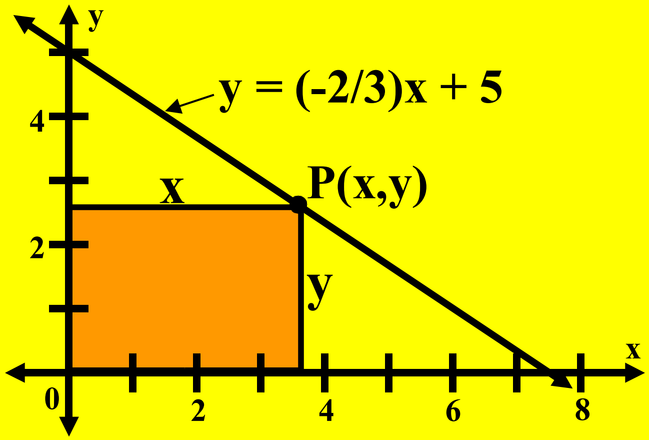

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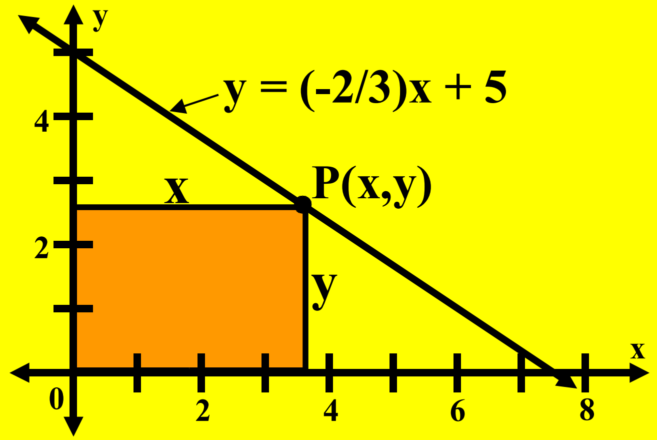

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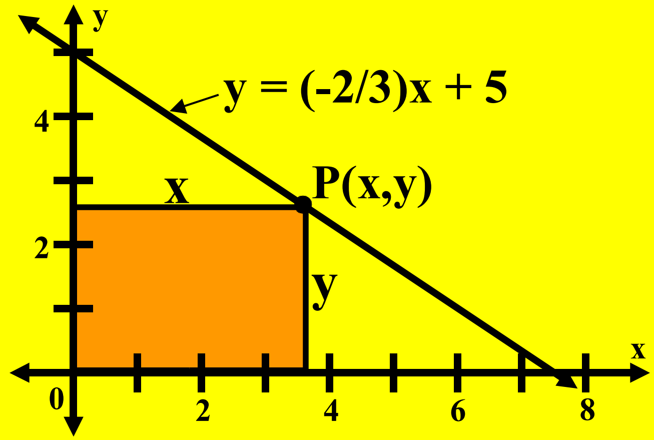

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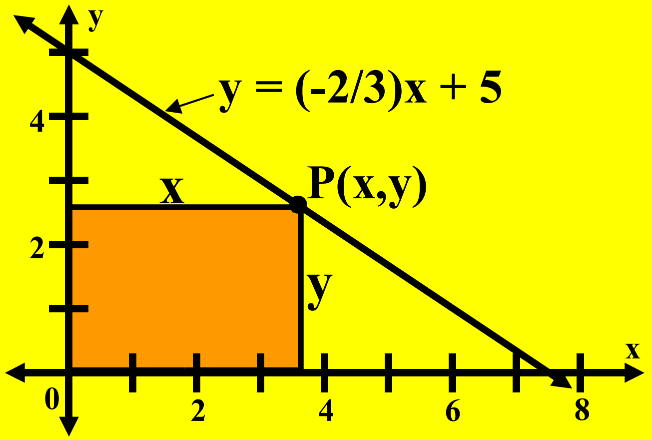

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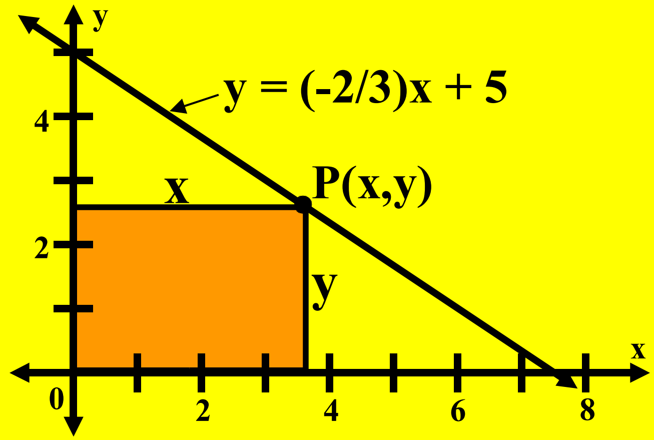

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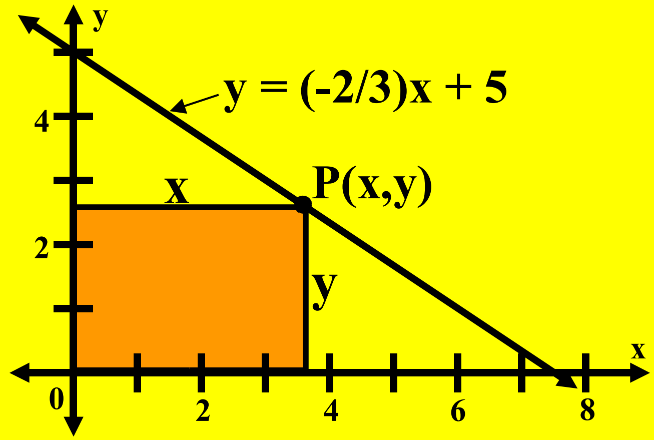

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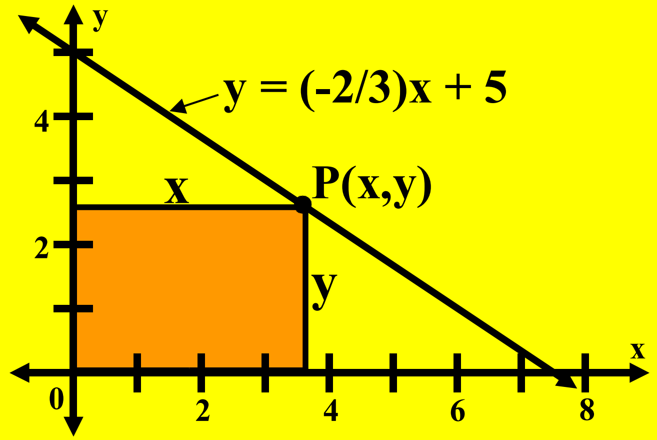

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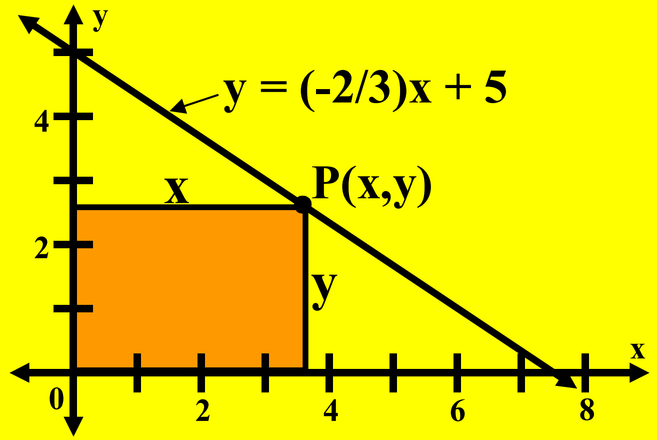

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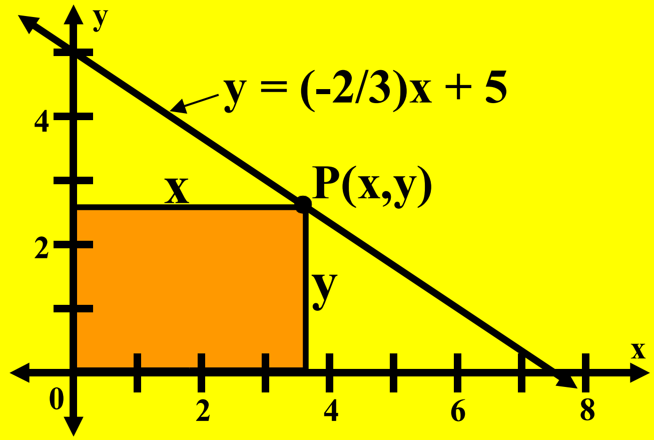

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Find the vertex !!

Express the function in 'vertex form'.

Given any 2nd degree function with one variable, $y = f(x) = Ax^2 + Bx + C$,

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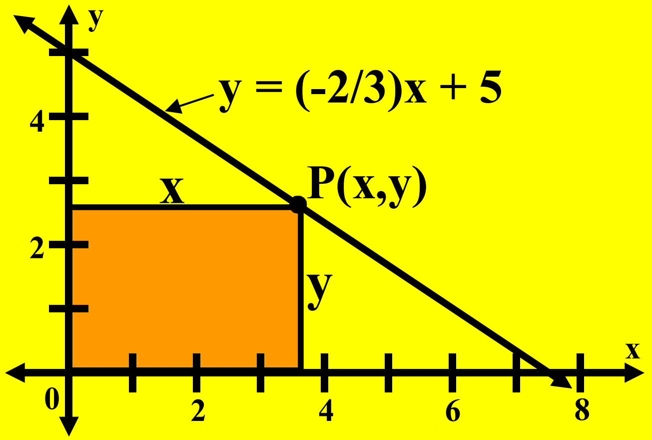

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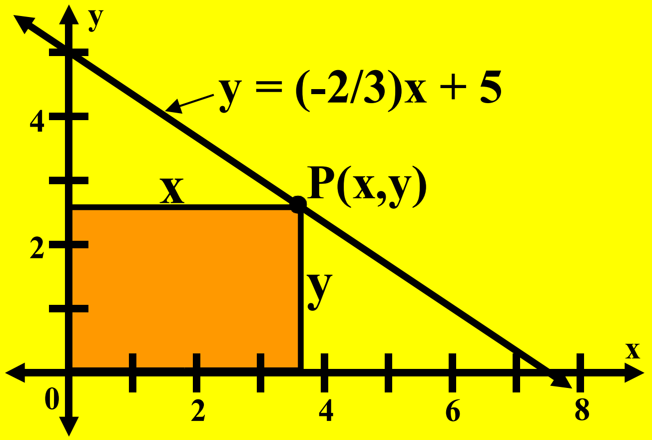

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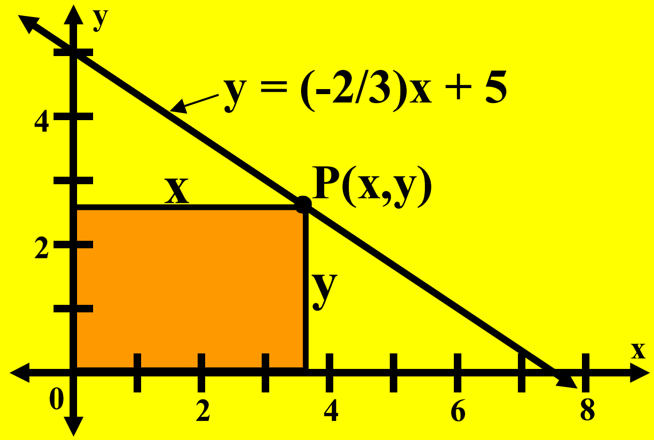

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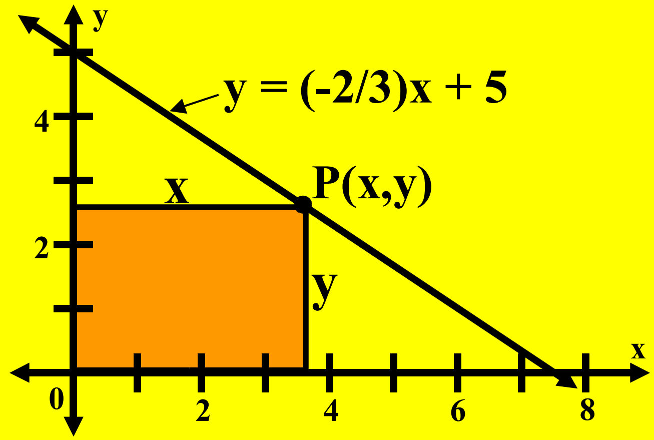

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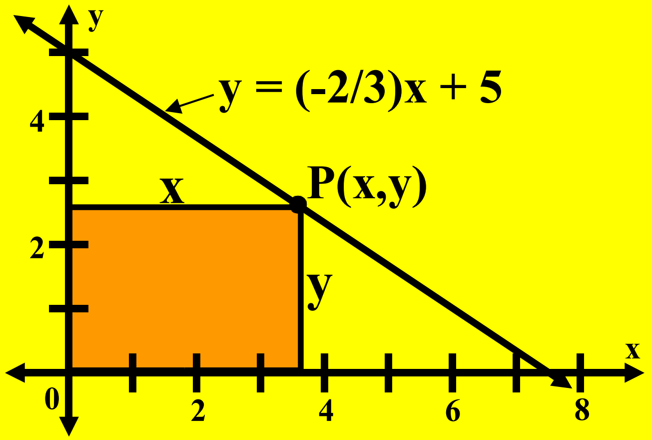

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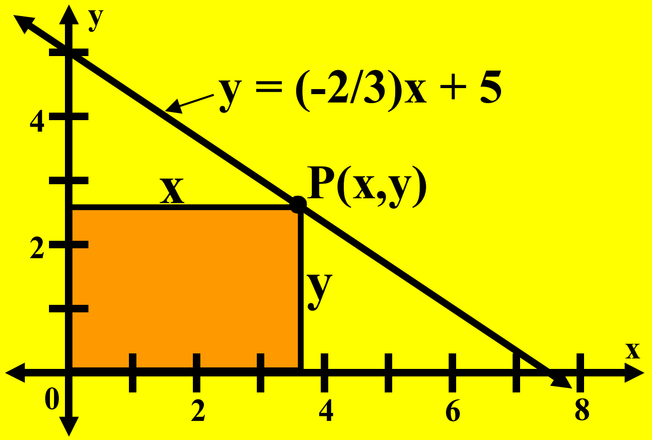

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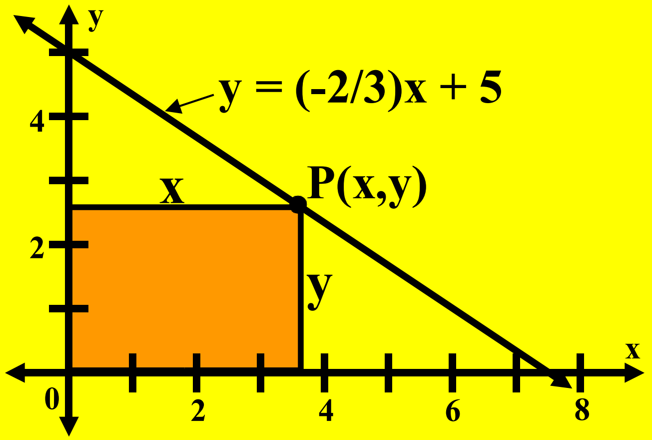

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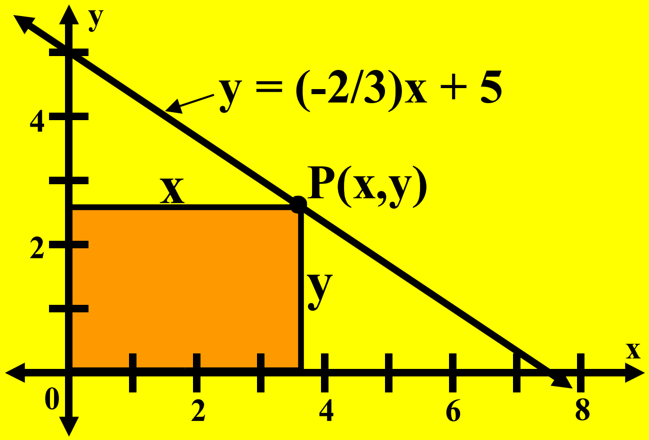

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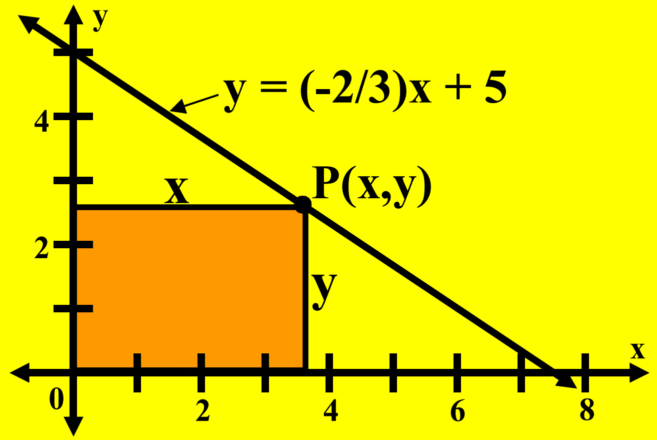

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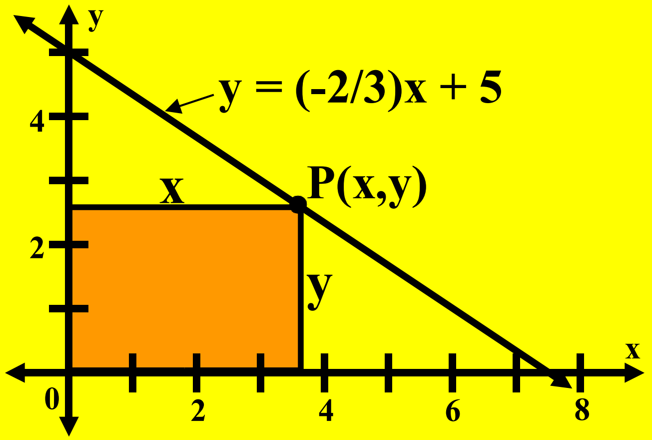

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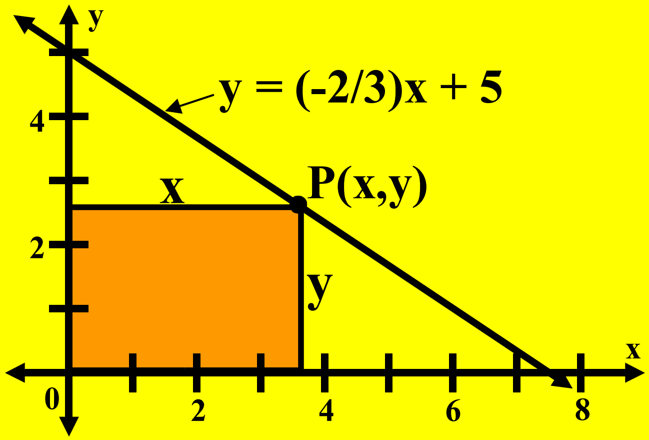

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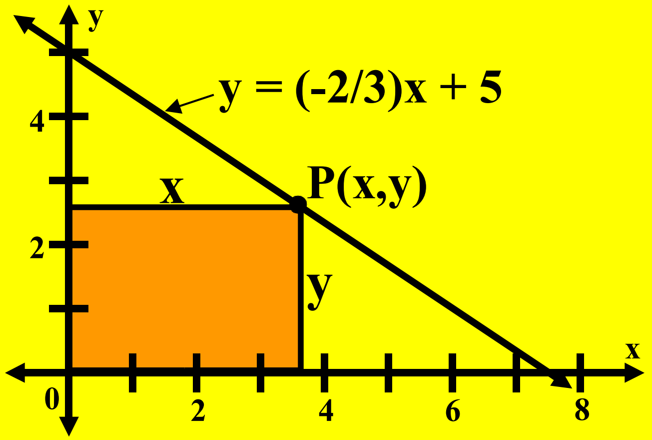

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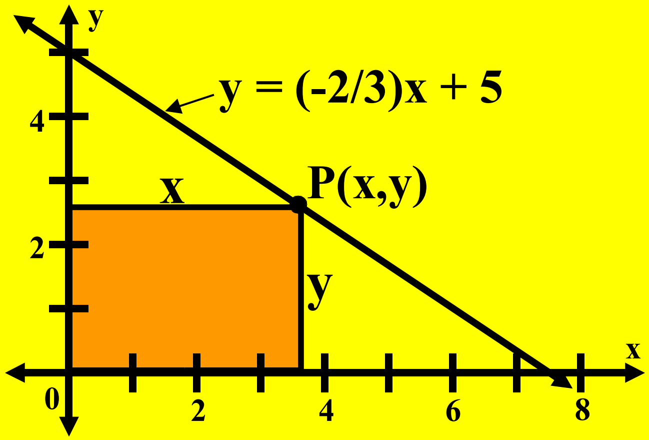

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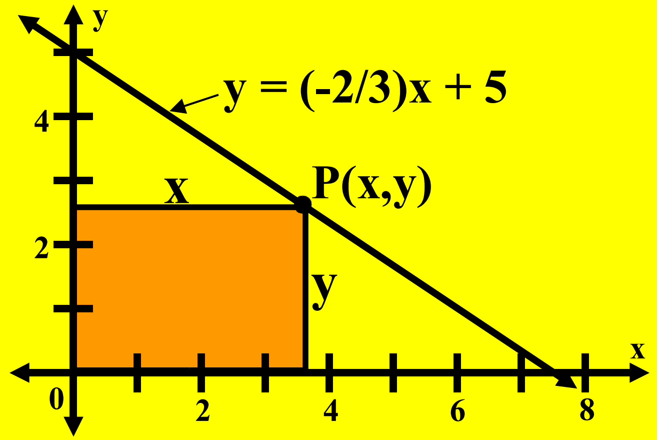

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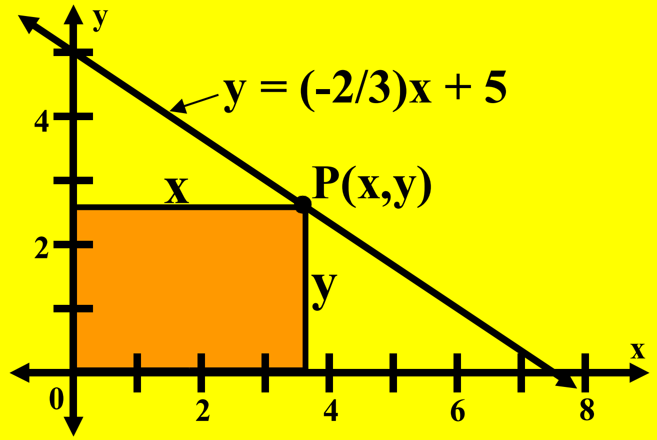

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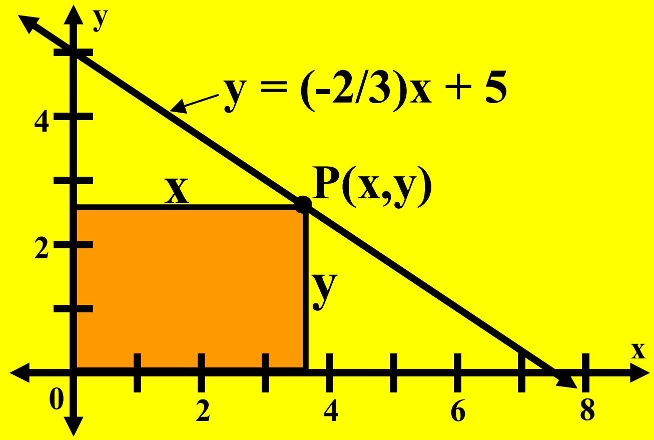

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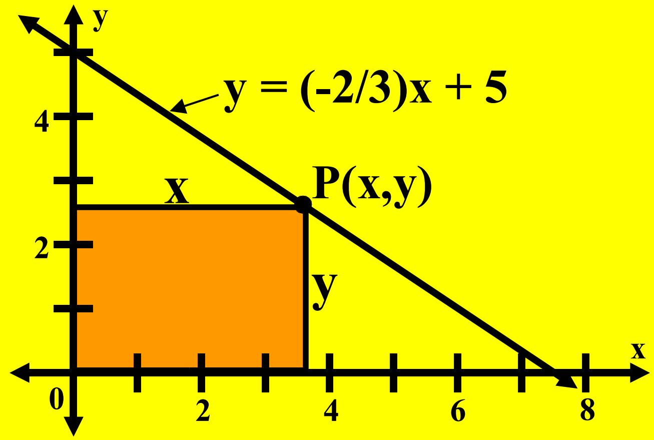

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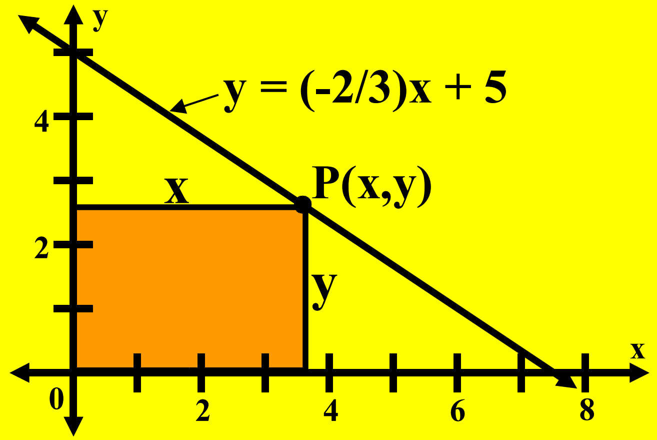

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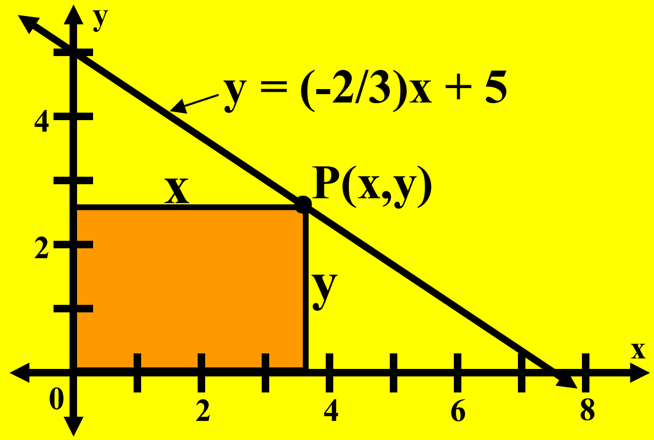

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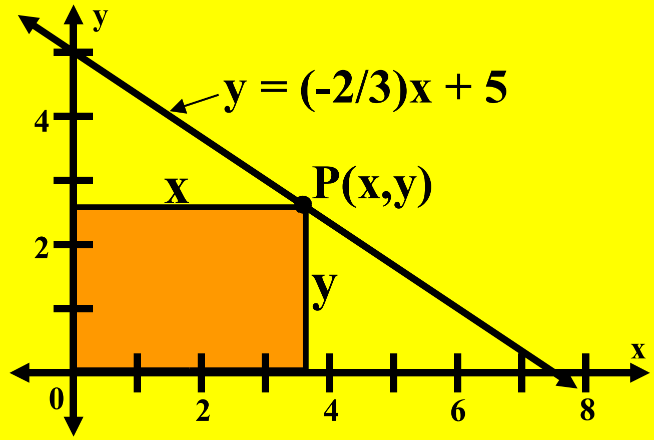

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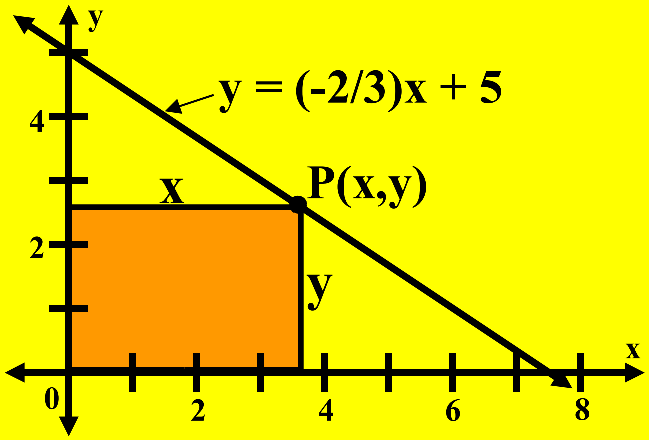

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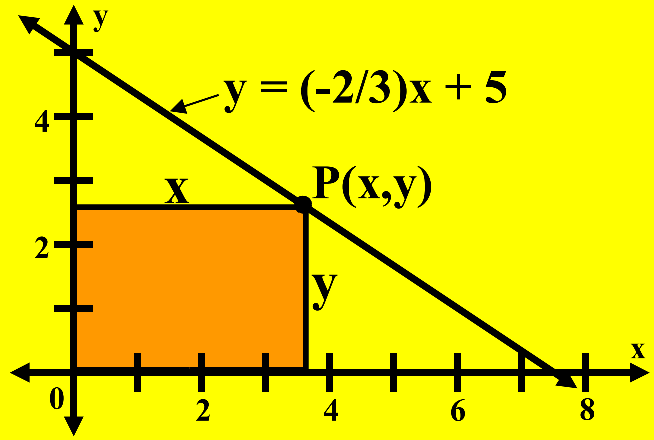

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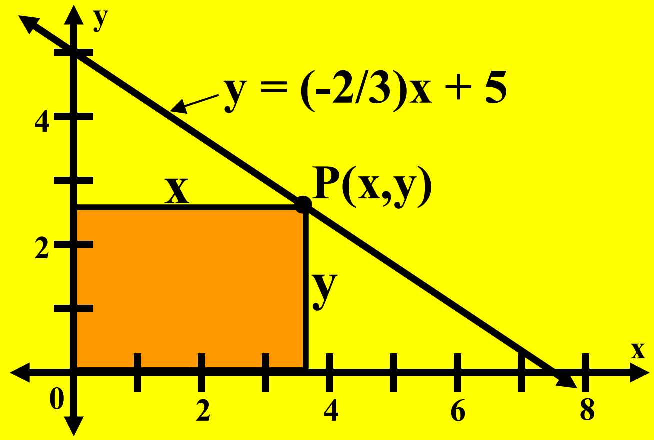

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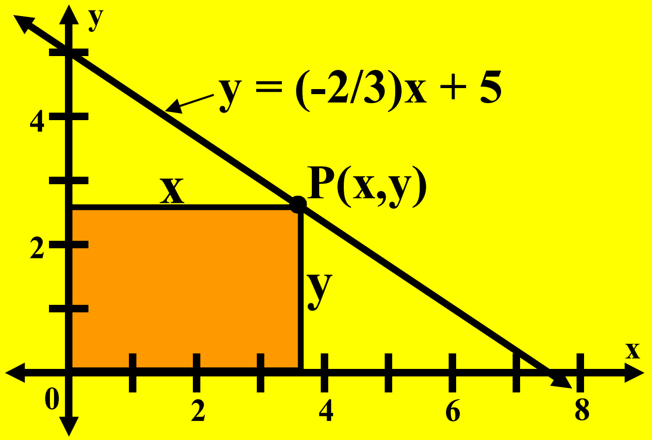

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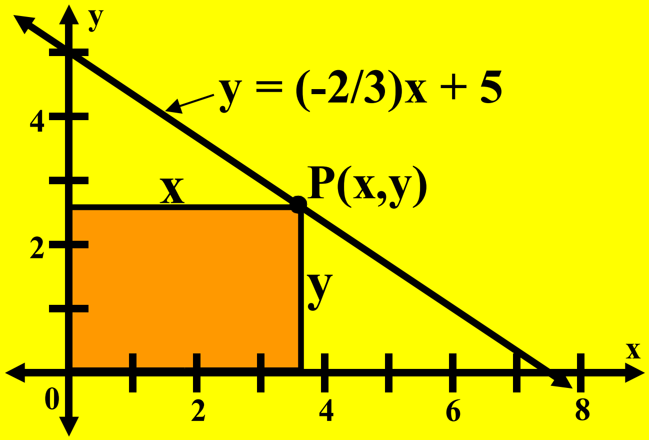

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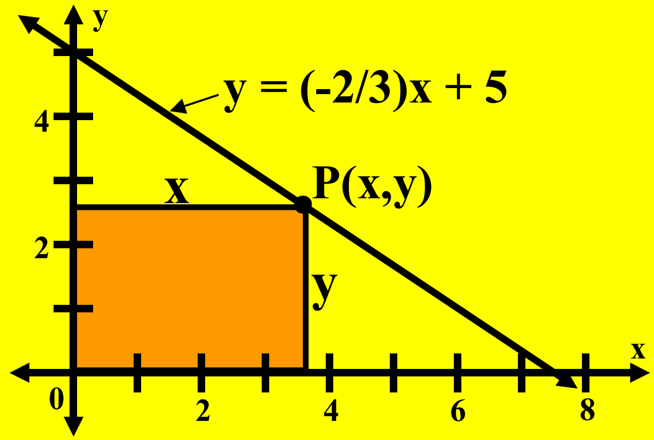

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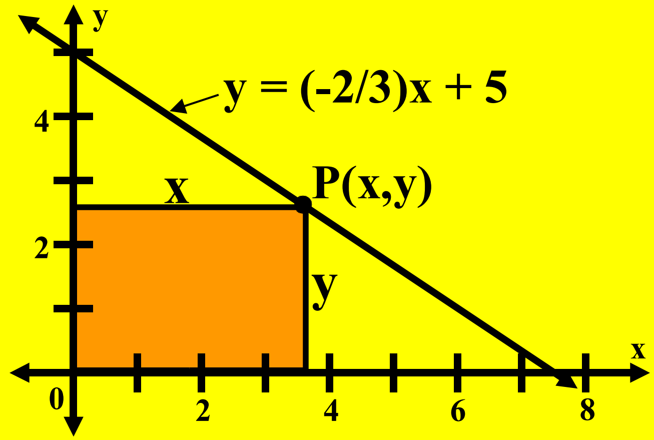

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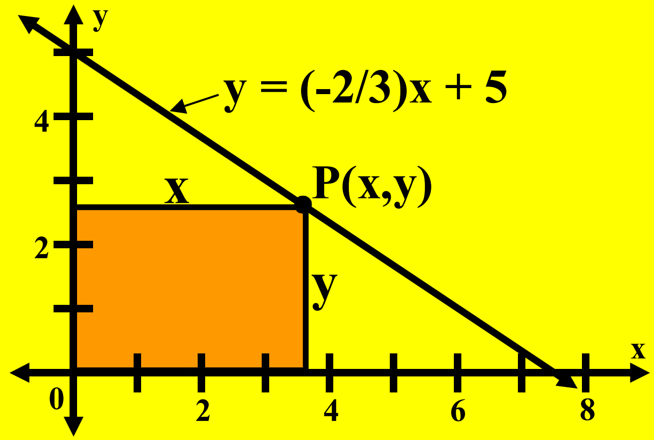

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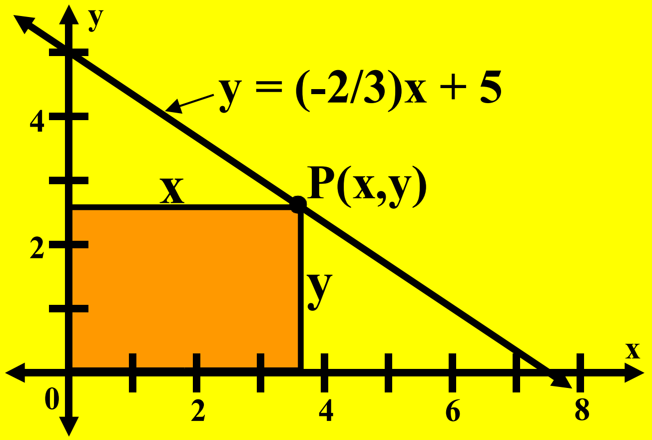

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$x = \frac{15}{4} \Rightarrow y =$

Algebra II Class Worksheet #2 Unit 8

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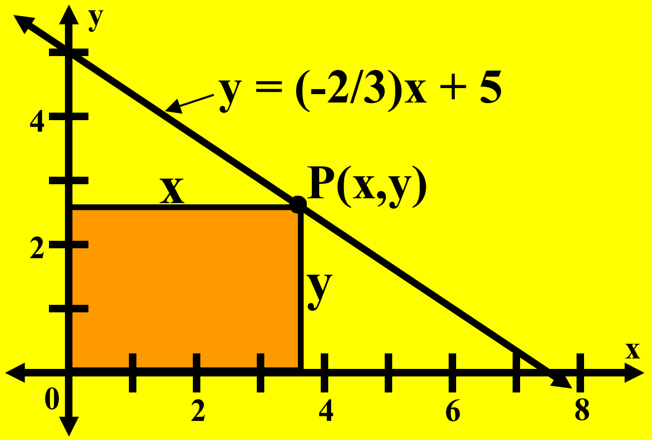

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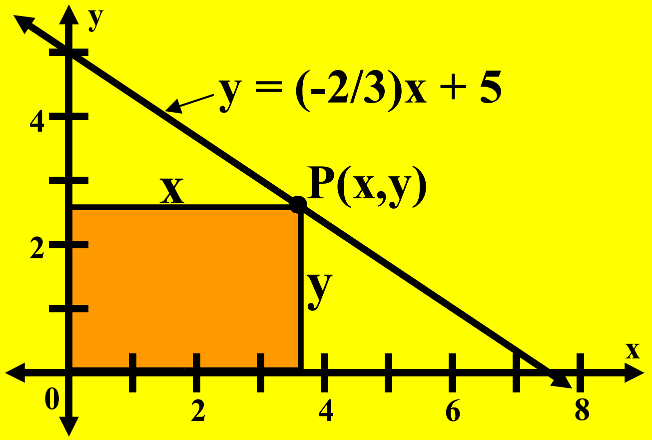

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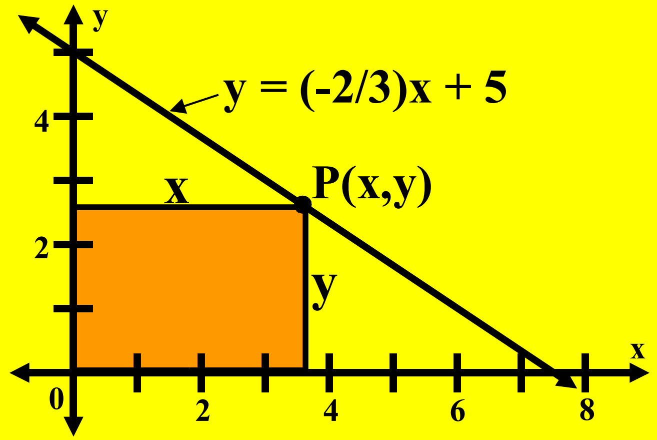

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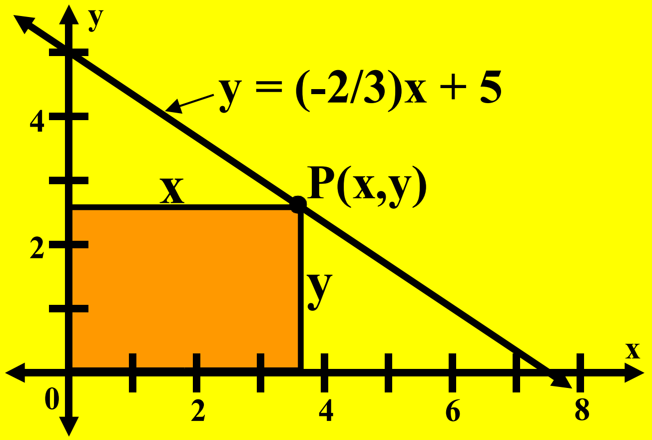

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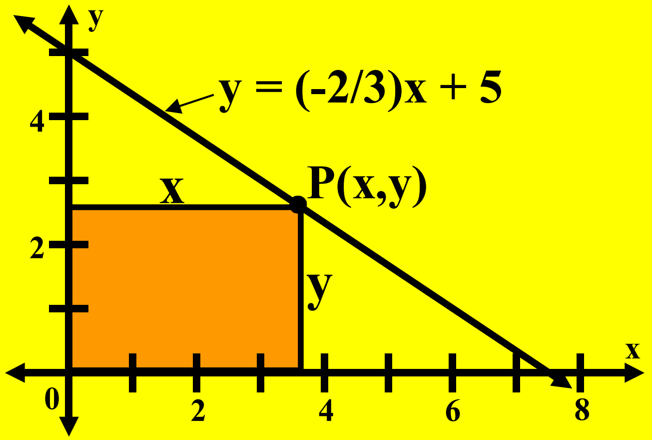

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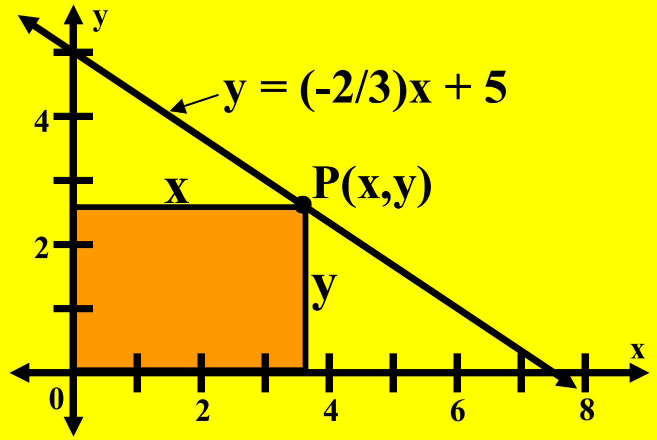

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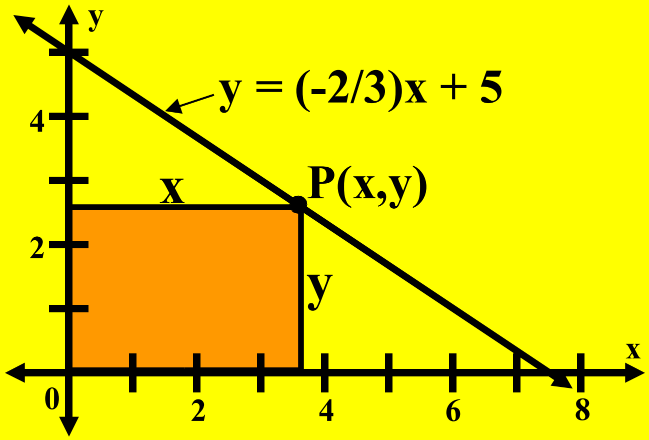

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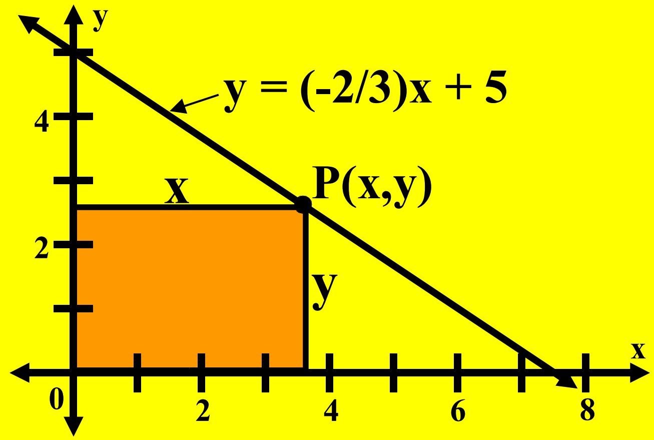

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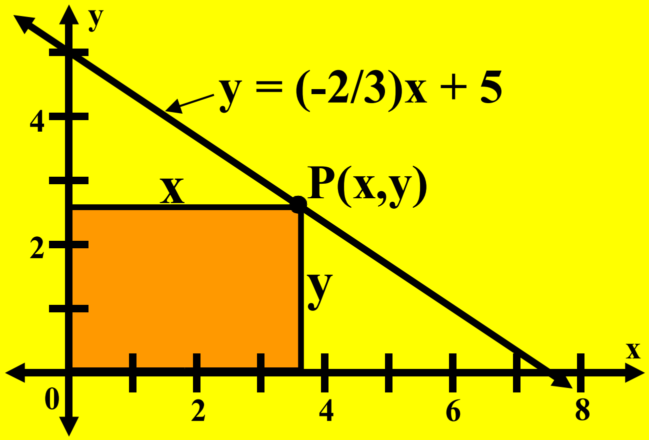

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The rectangle with maximum area is 3.75 units long

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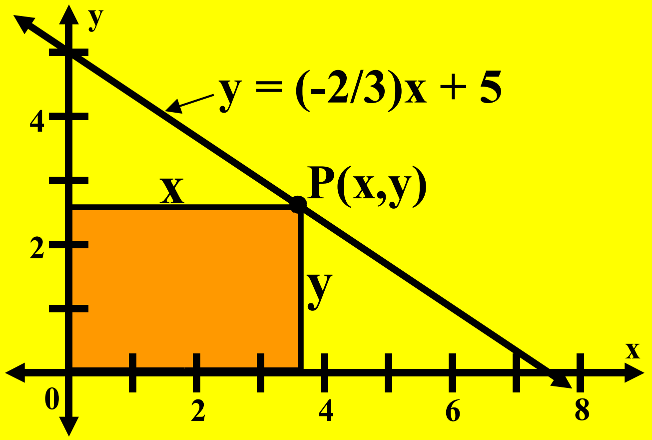

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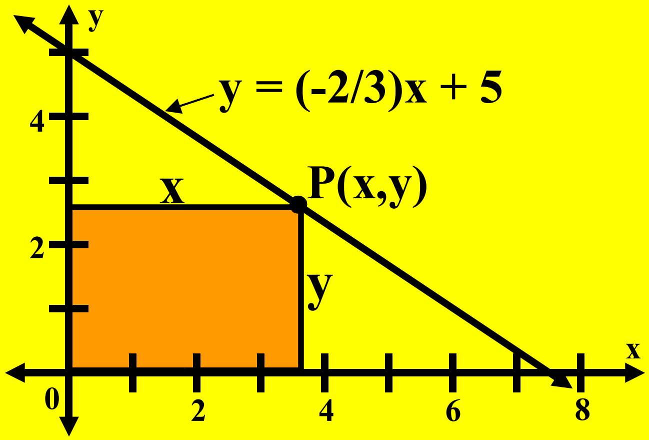

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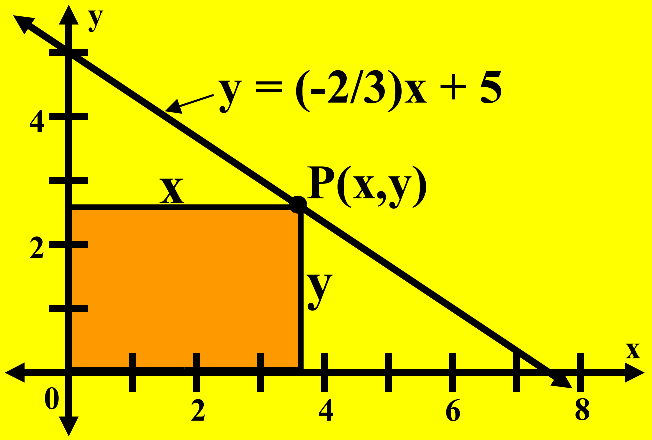

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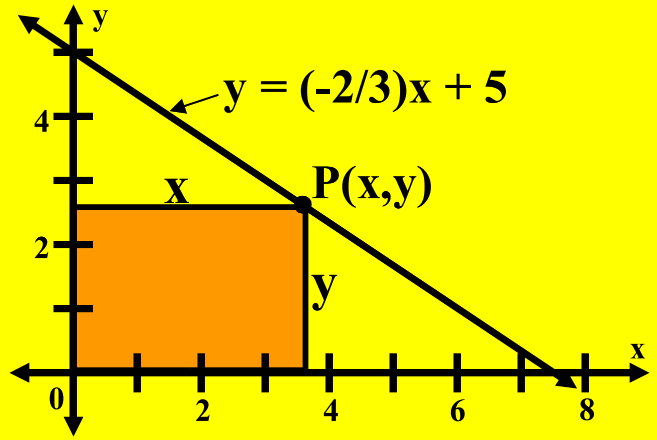

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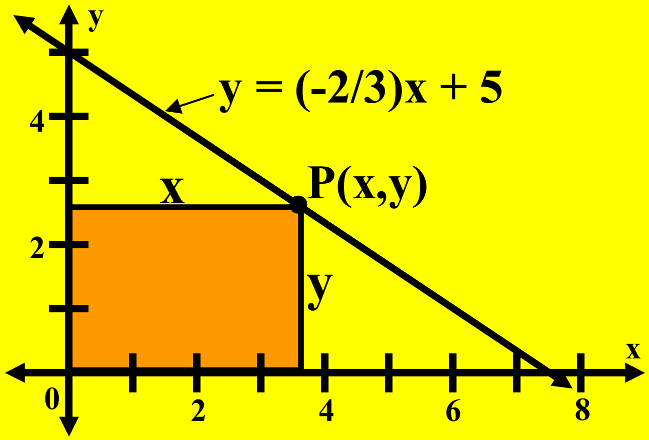

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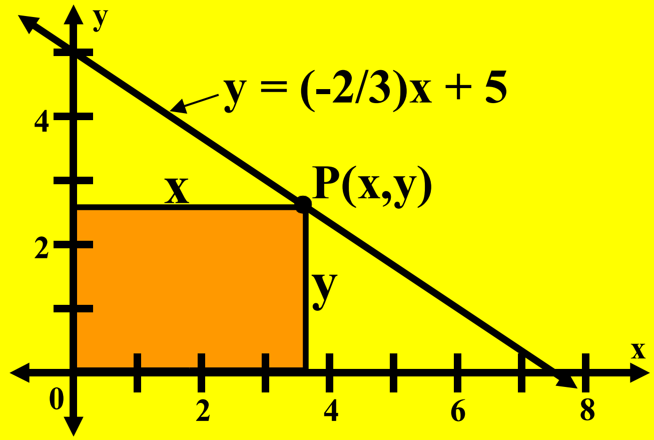

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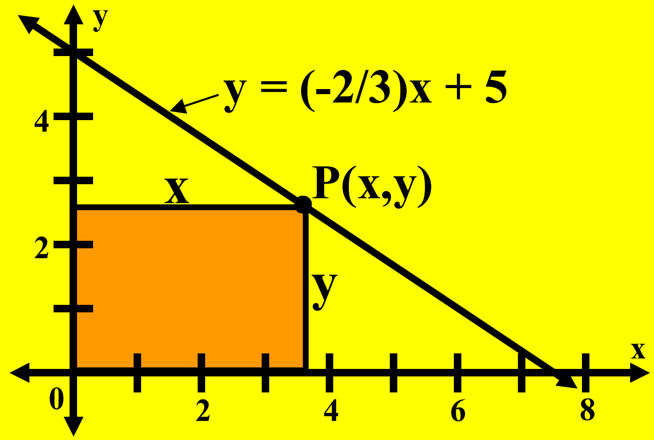

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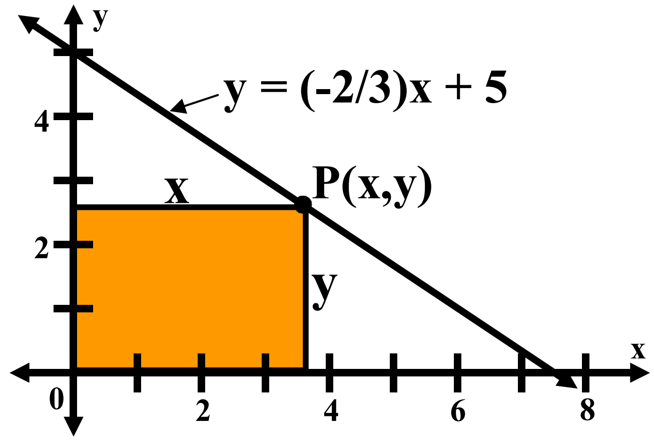

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The rectangle with maximum area is 3.75 units long and 2.5 units wide. Its area is 9.375 square units.

Algebra II Class Worksheet #2 Unit 8

2. Alice wants to fence in a rectangular plot of land and to divide it into three equal areas using two lengths of fencing parallel to two opposite sides. If she has a total of 1000 feet of fencing to work with, then find the dimensions that will maximize the total area enclosed. What is the maximum area?

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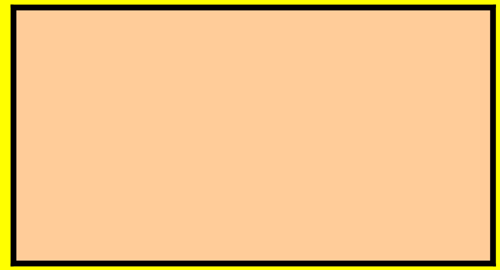

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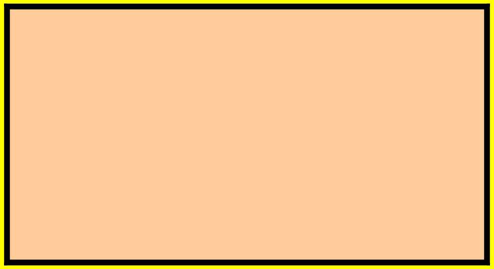

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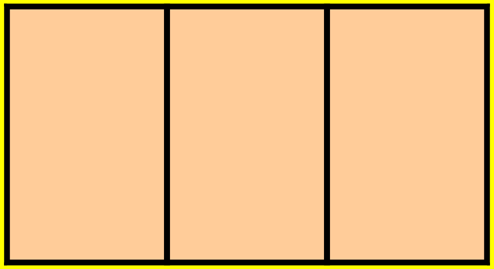

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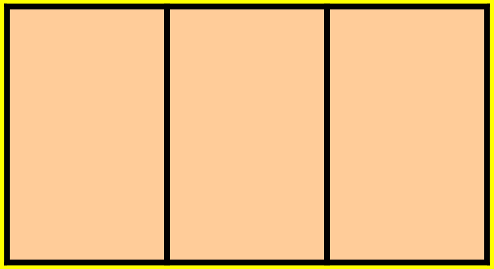

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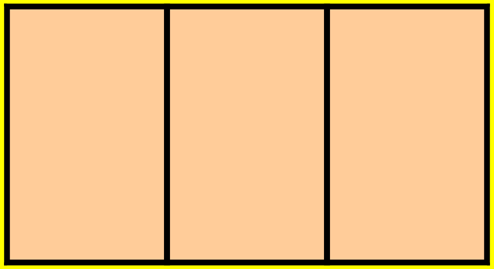

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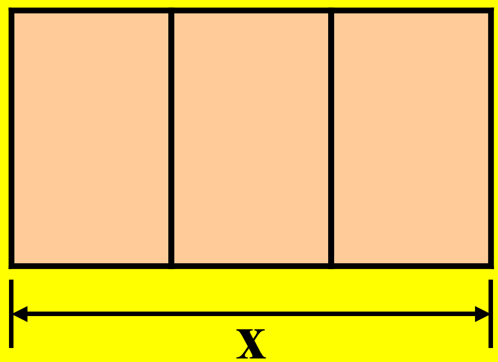

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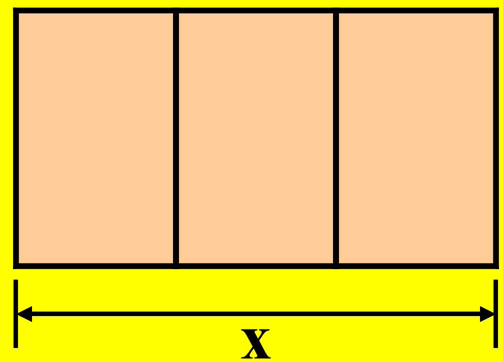

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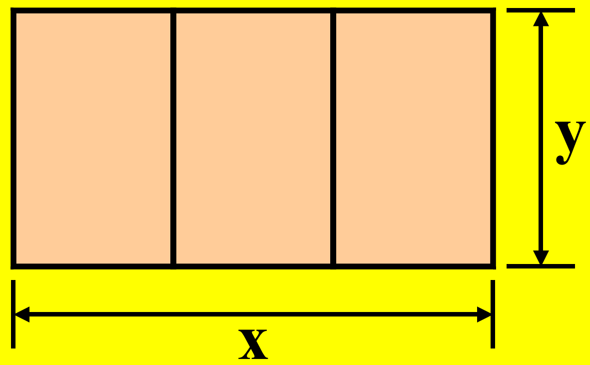

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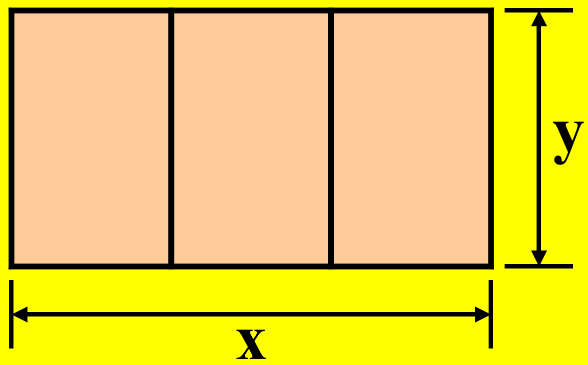

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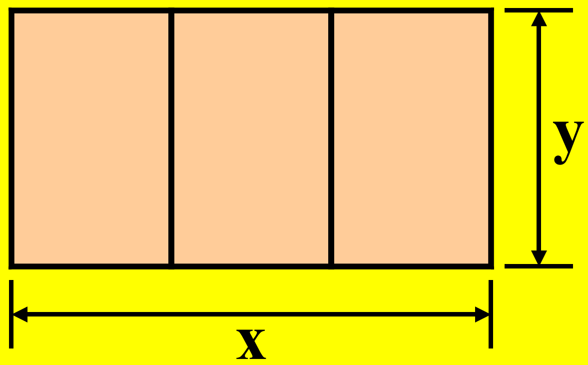

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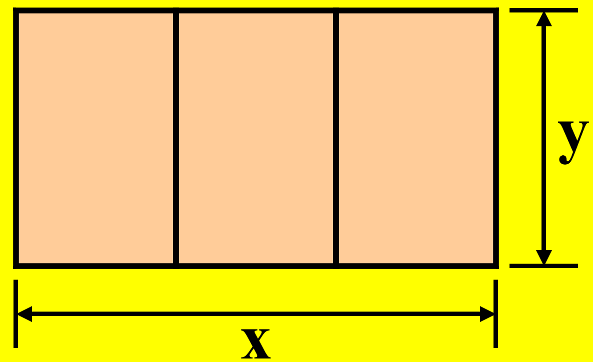

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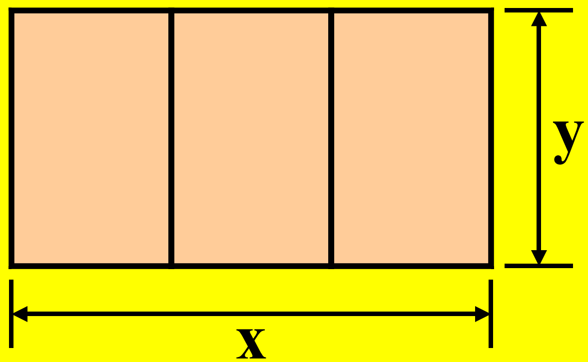

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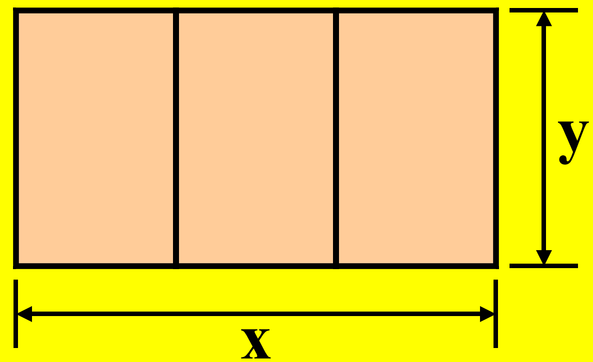

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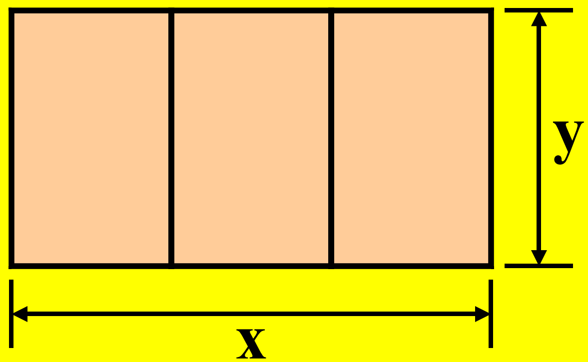

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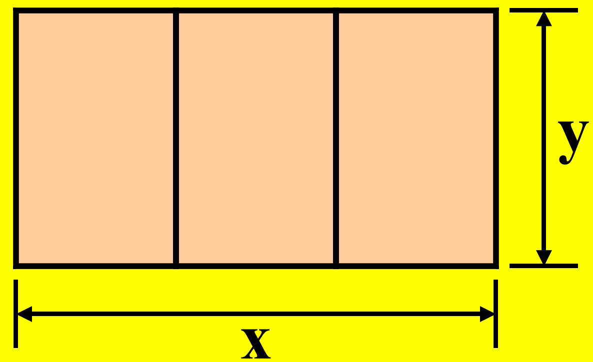

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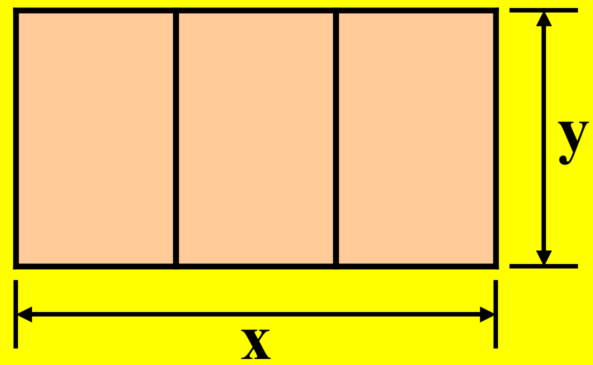

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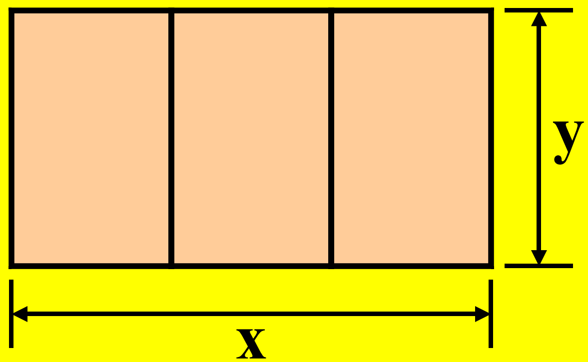

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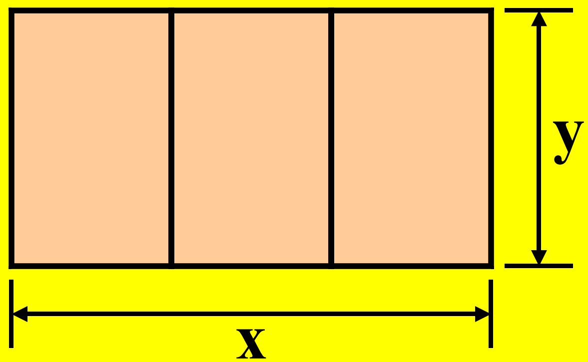

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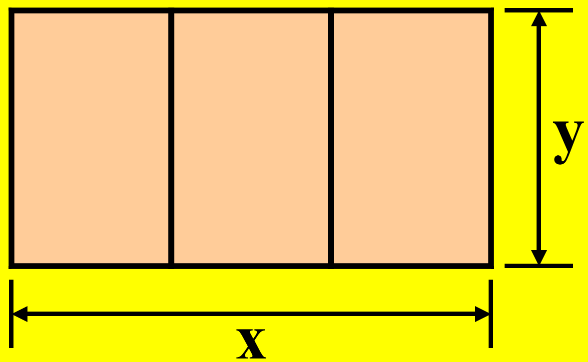

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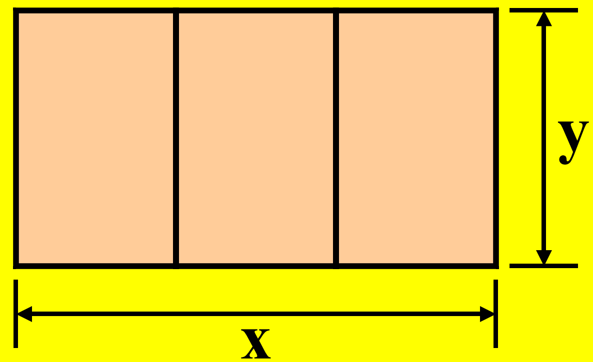

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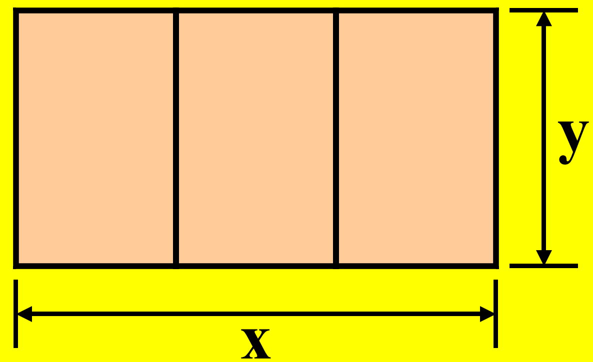

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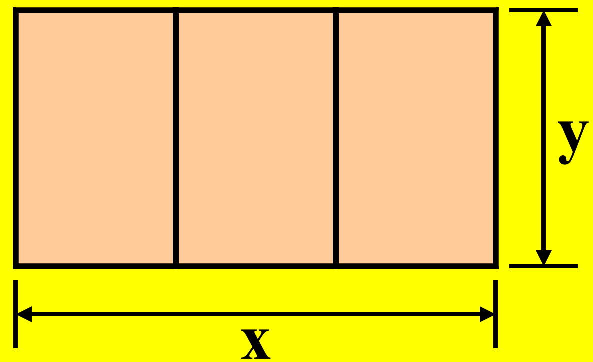

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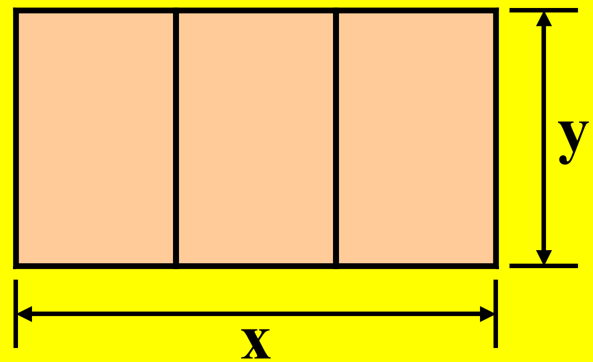

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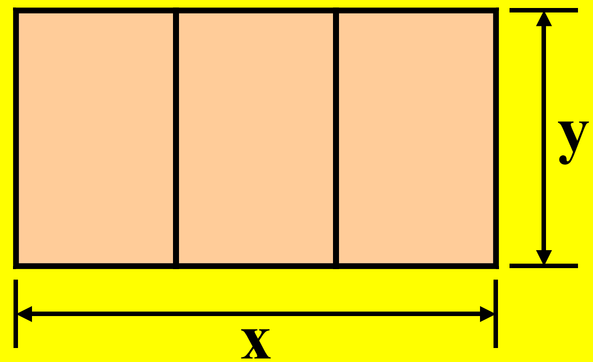

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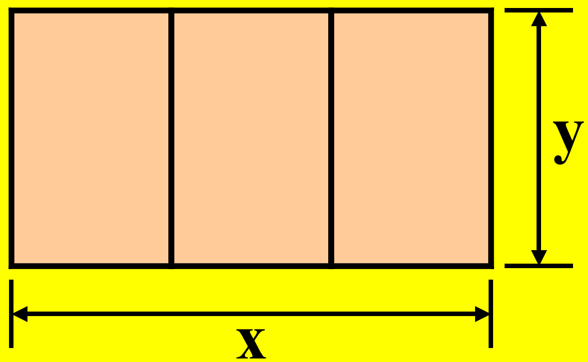

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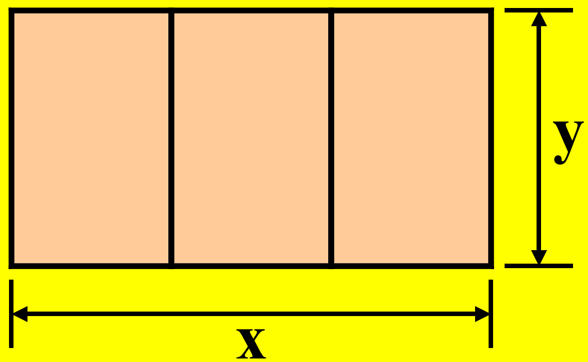

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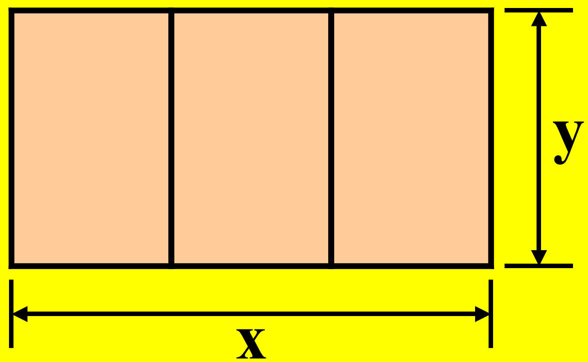

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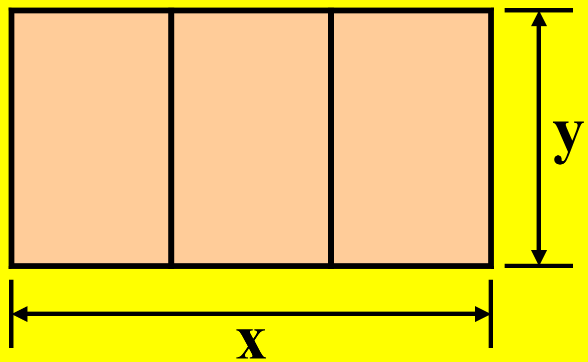

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Add -2x to each side.

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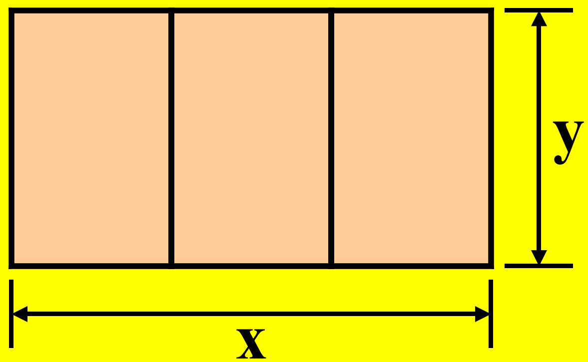

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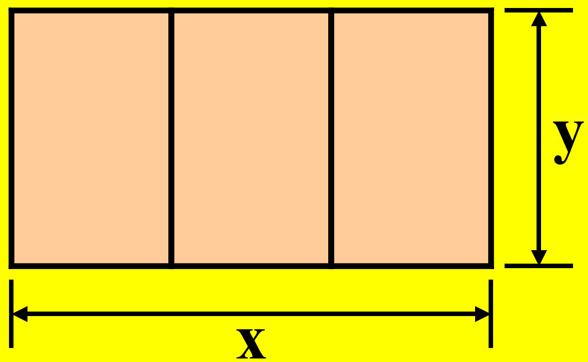

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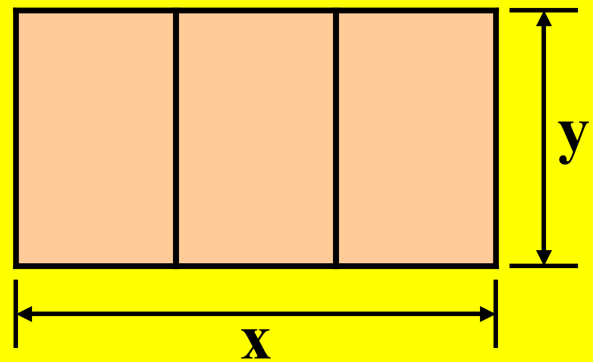

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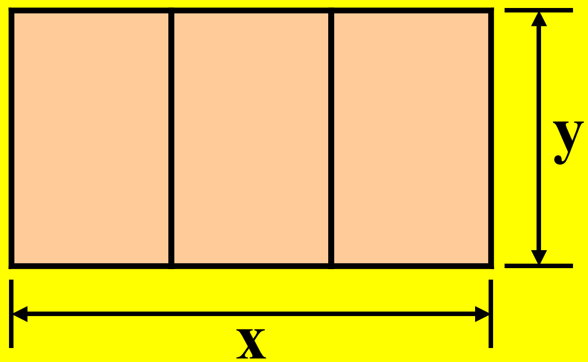

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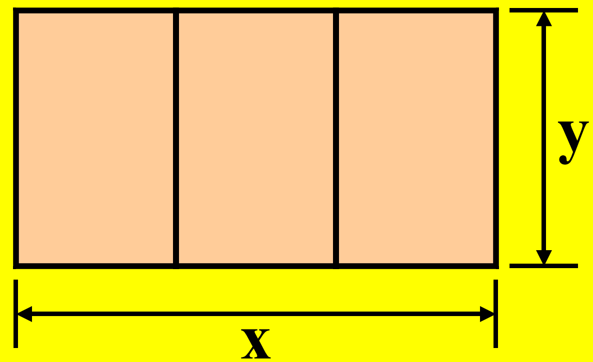

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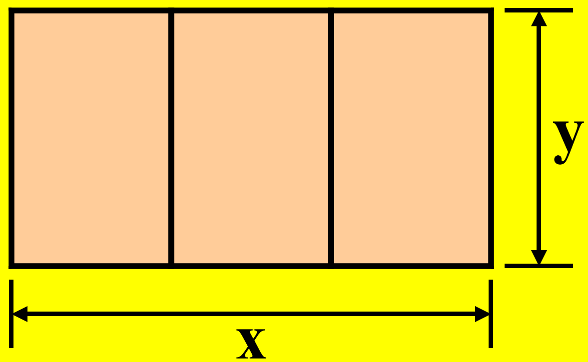

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Solve for y.

Divide each side by 4.

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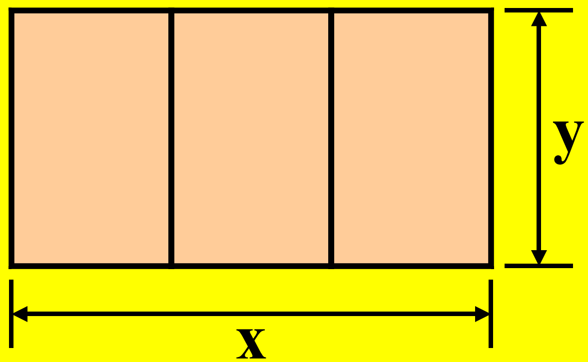

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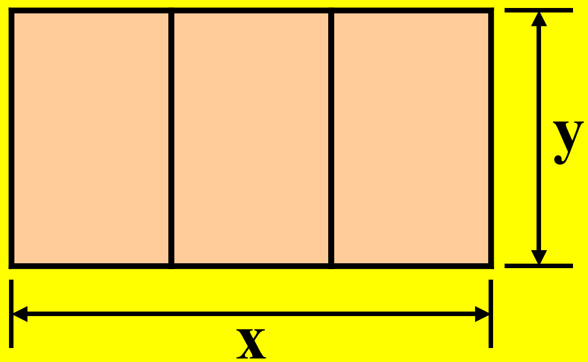

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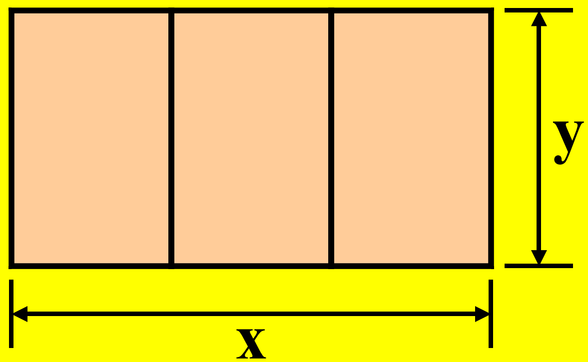

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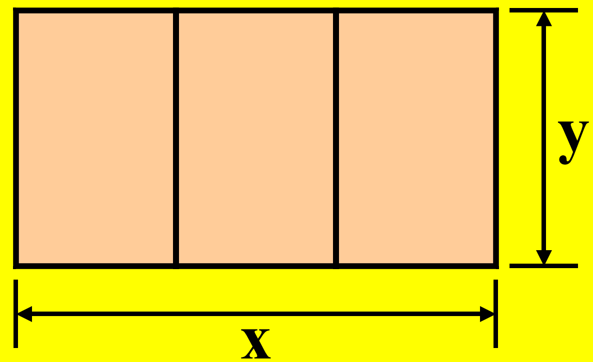

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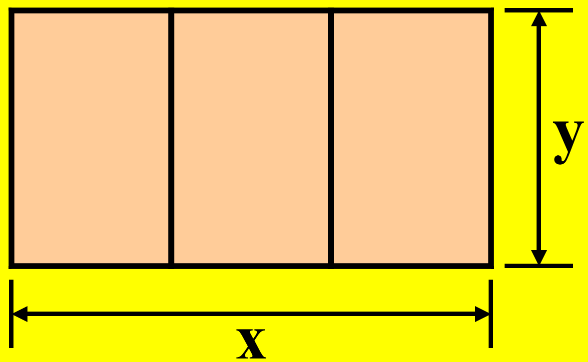

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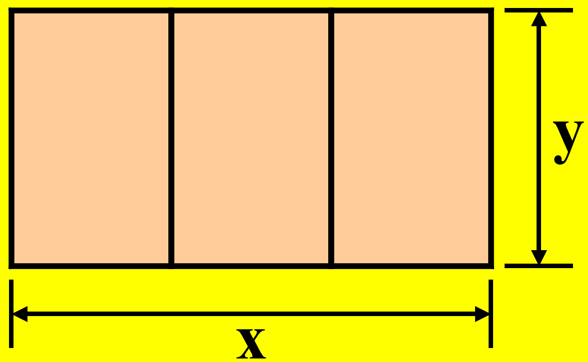

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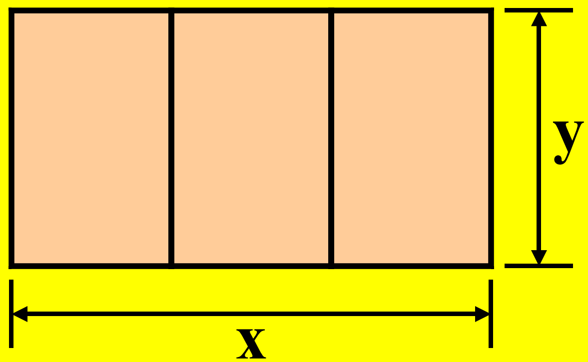

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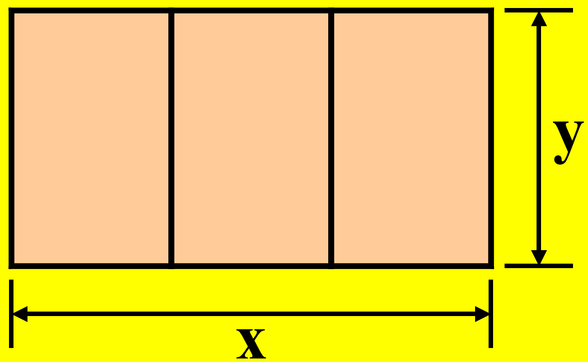

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Now, substitute this for y in the area equation.

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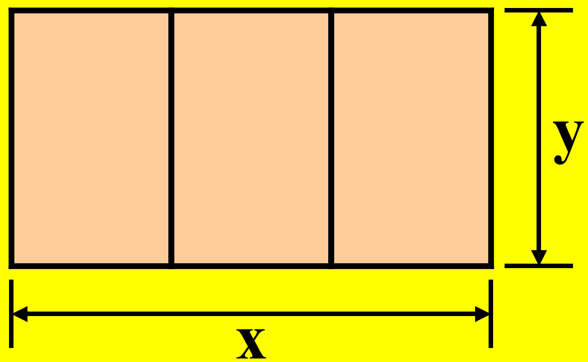

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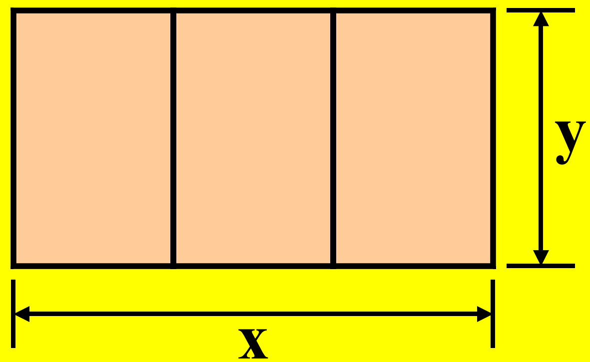

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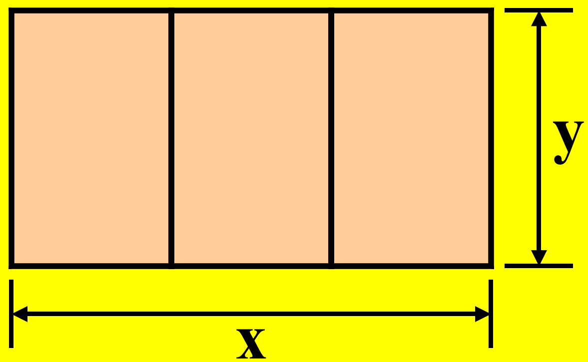

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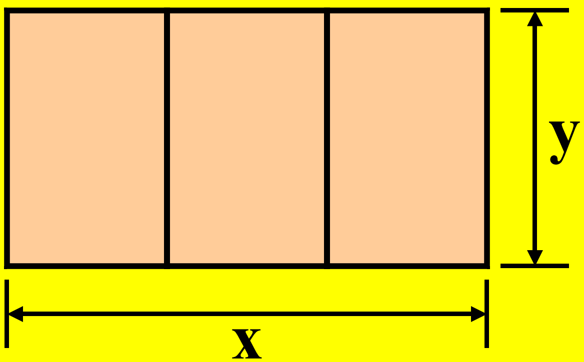

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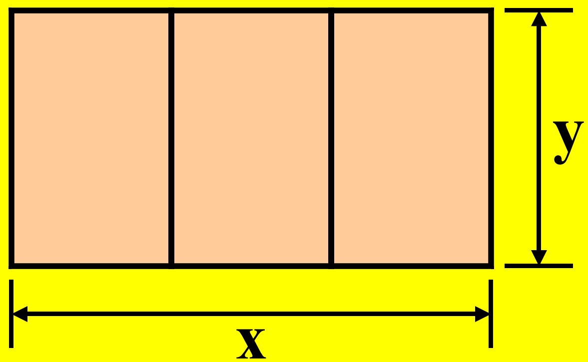

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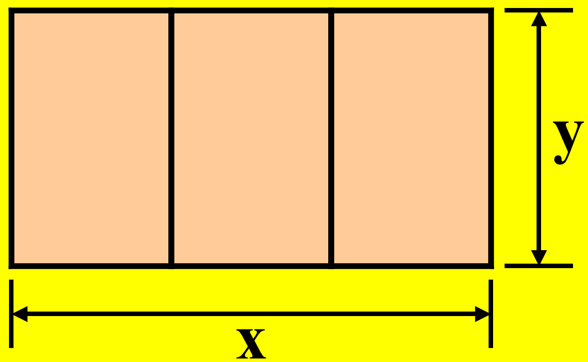

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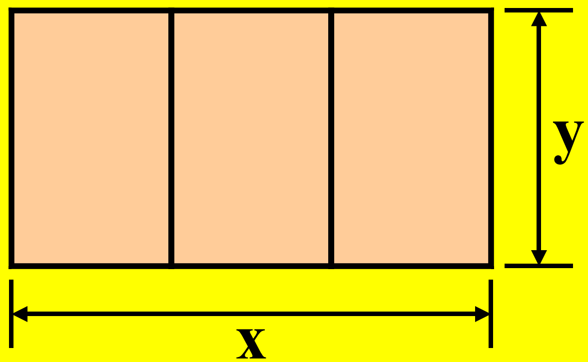

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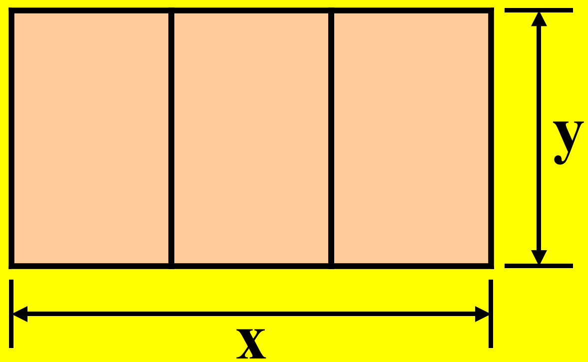

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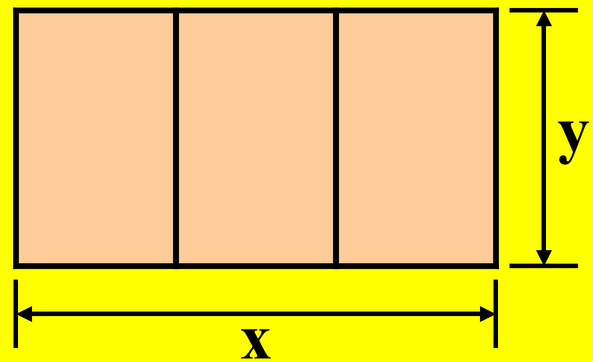

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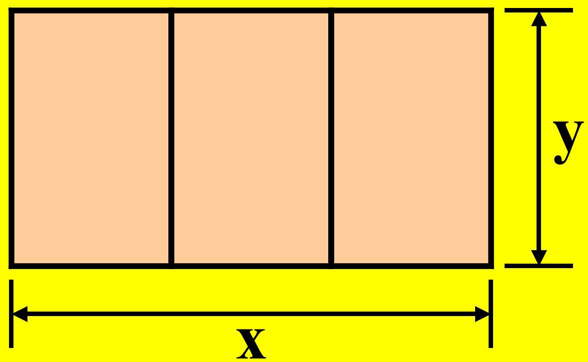

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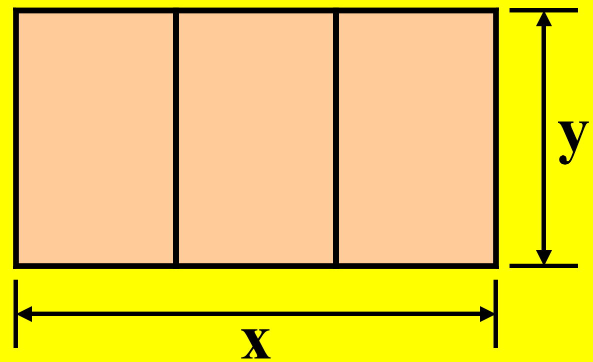

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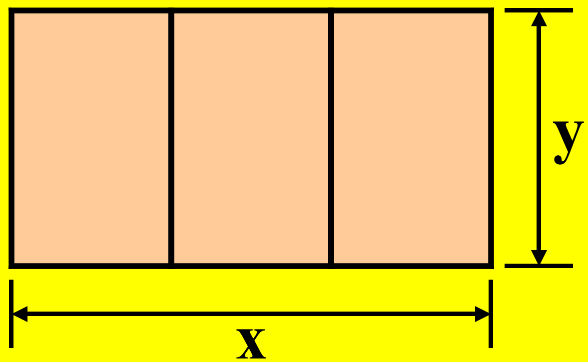

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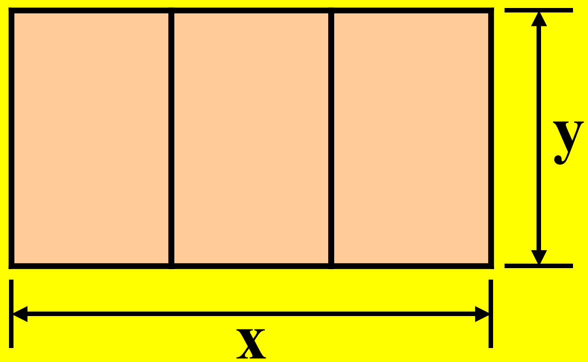

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Express the function in 'vertex form'.

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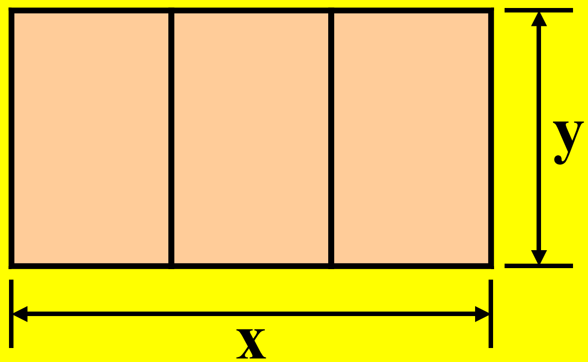

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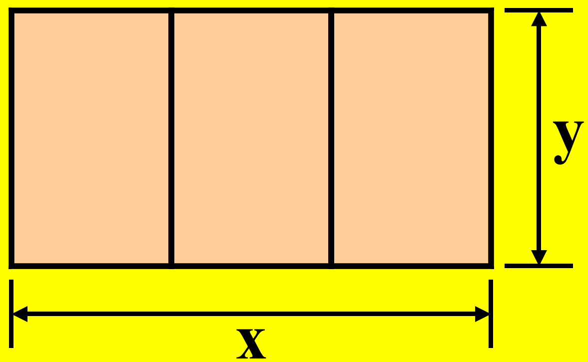

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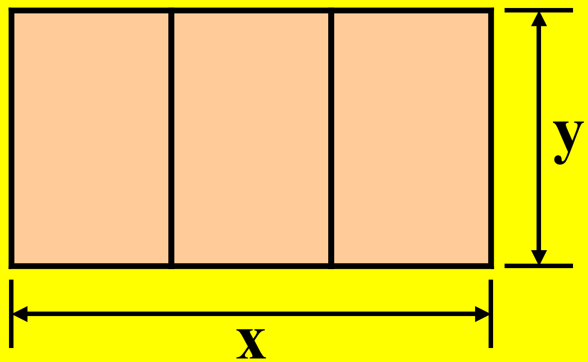

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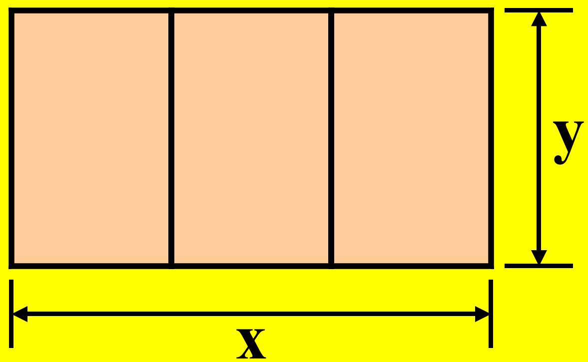

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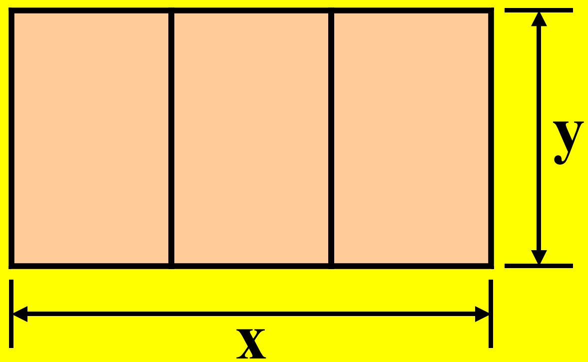

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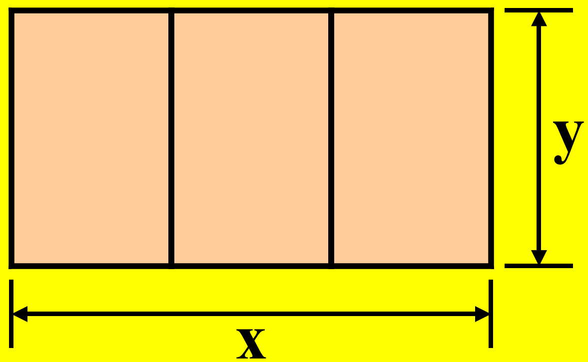

Find the vertex !!

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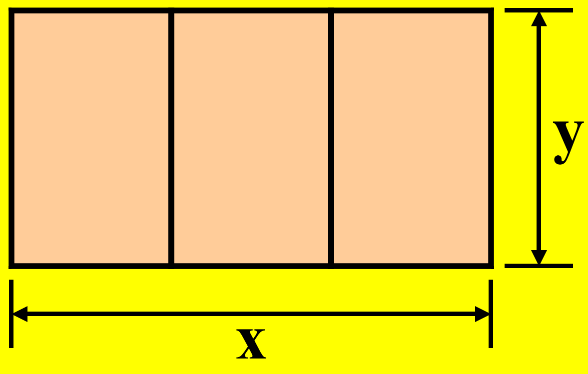

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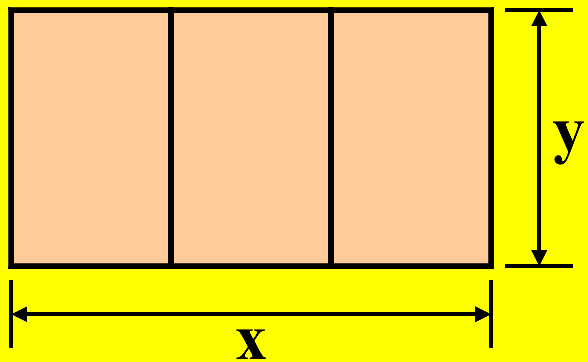

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Complete the square.

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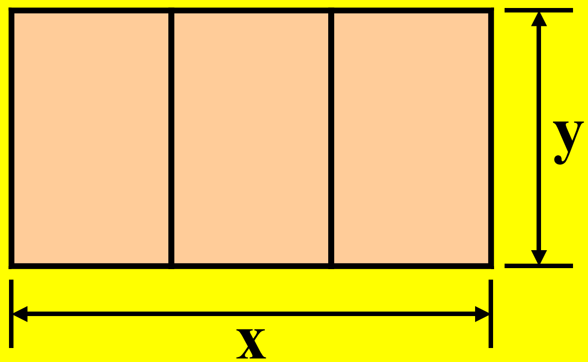

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$y = \frac{-1}{2}x + 250$

Complete the square.

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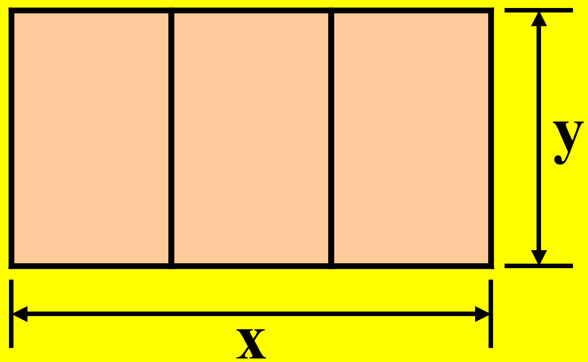

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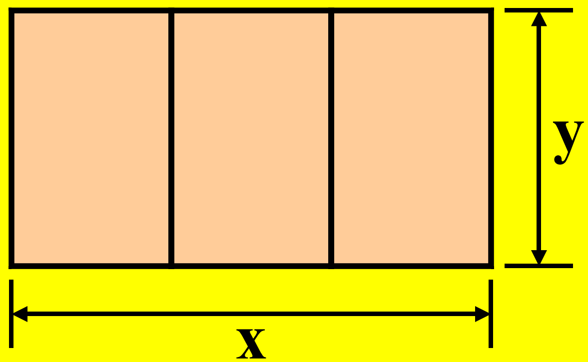

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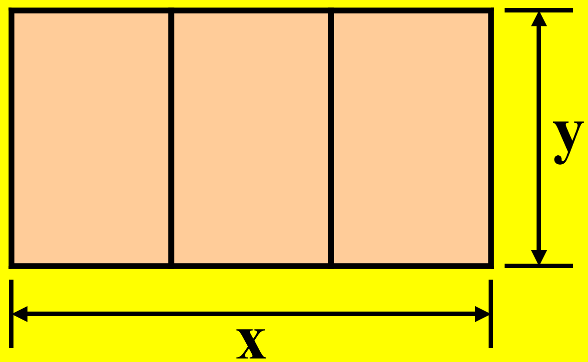

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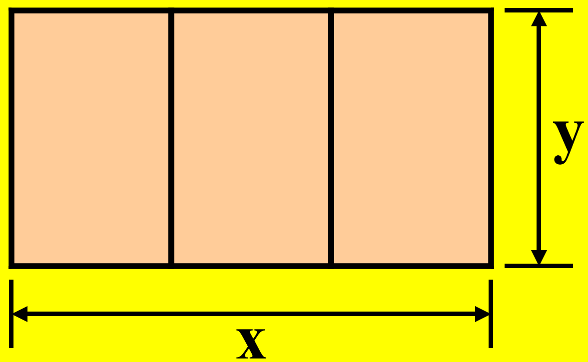

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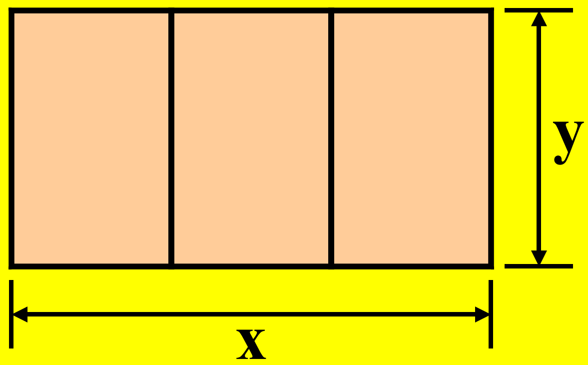

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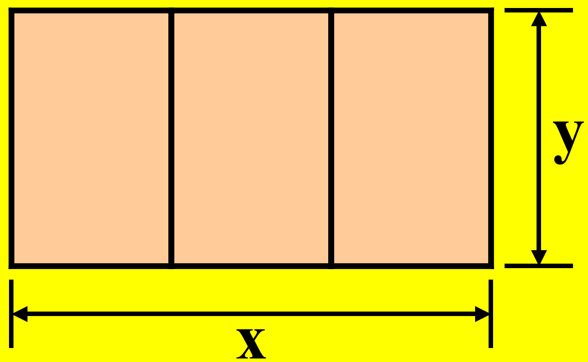

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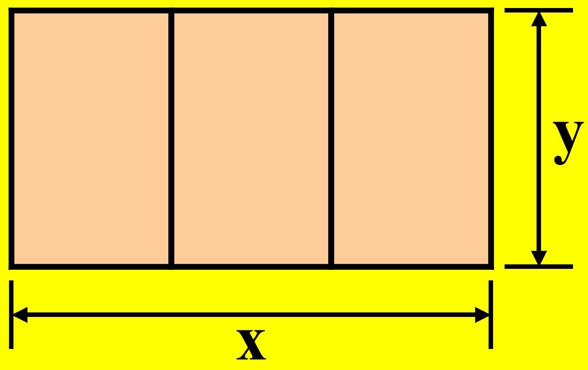

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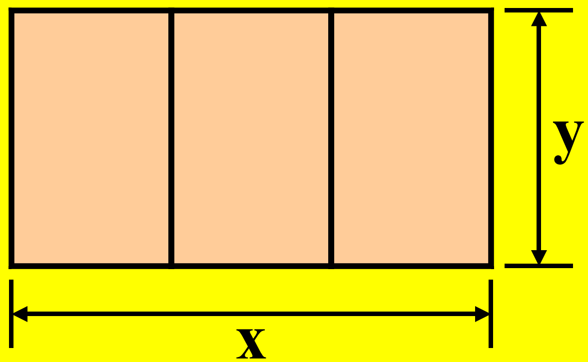

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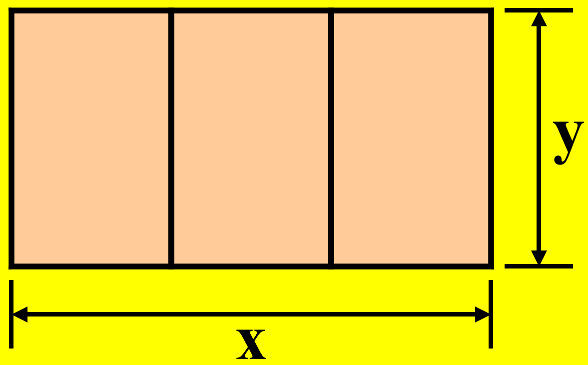

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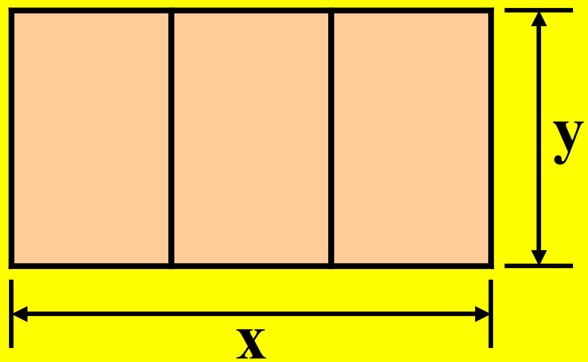

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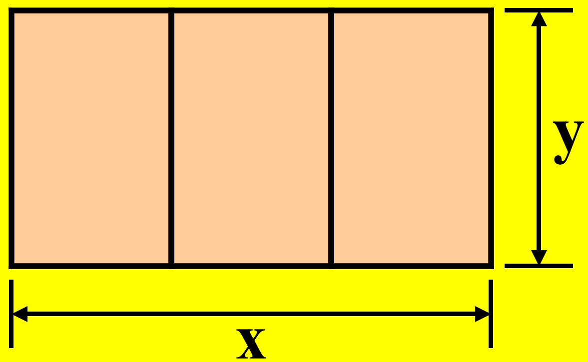

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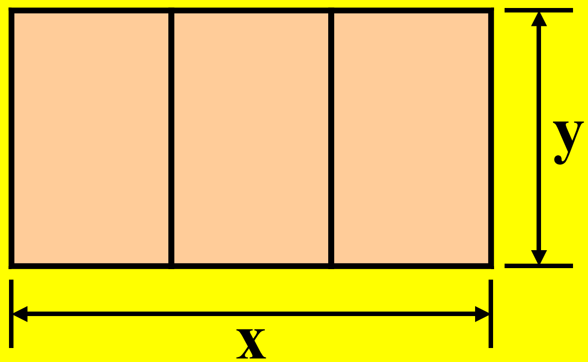

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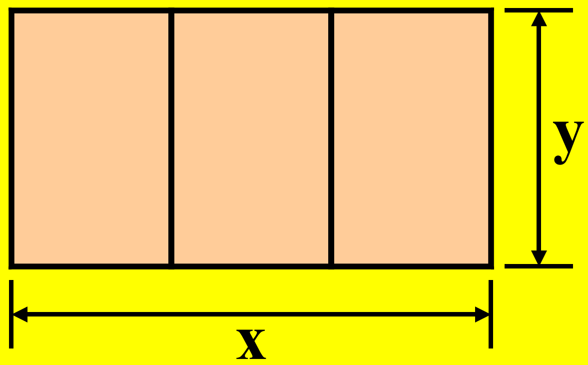

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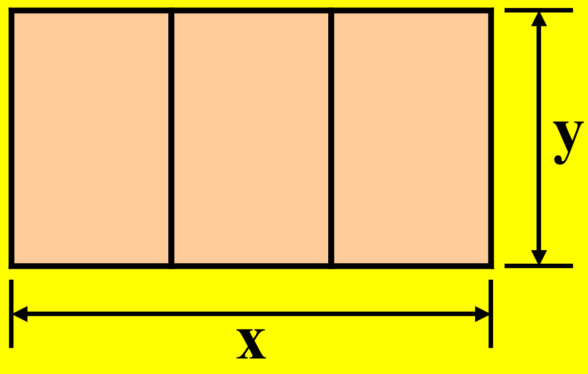

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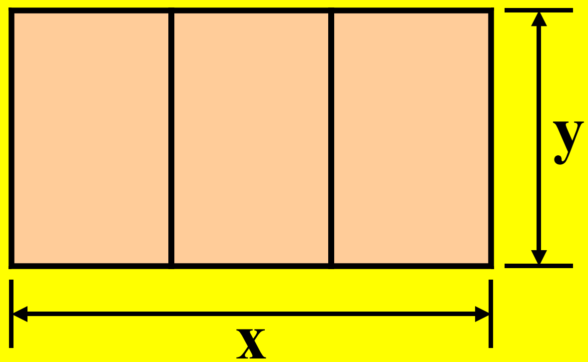

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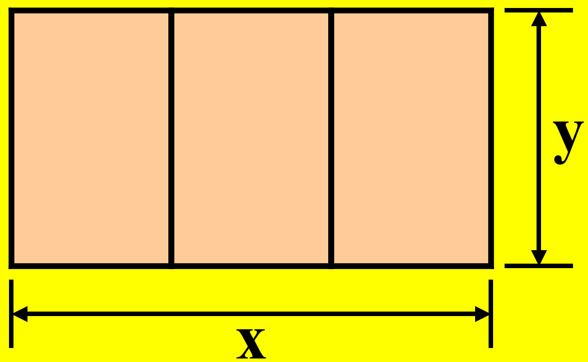

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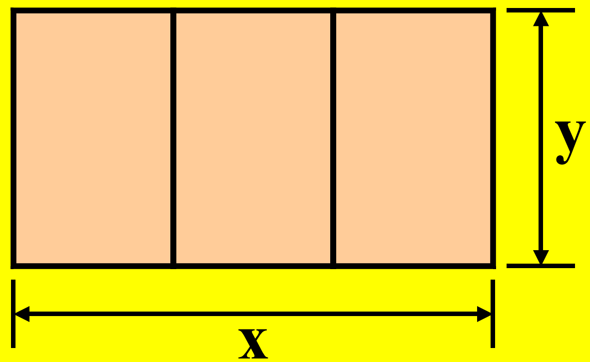

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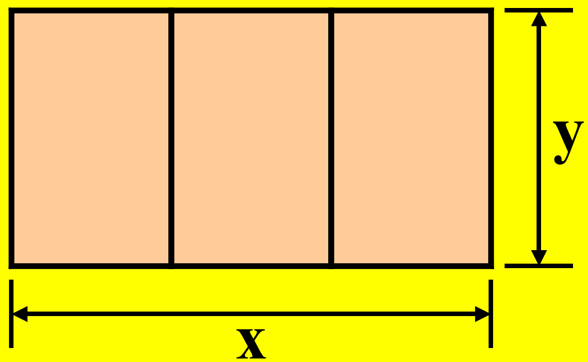

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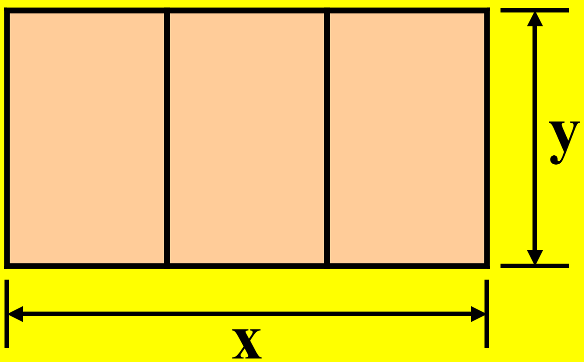

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Algebra II Class Worksheet #2 Unit 8

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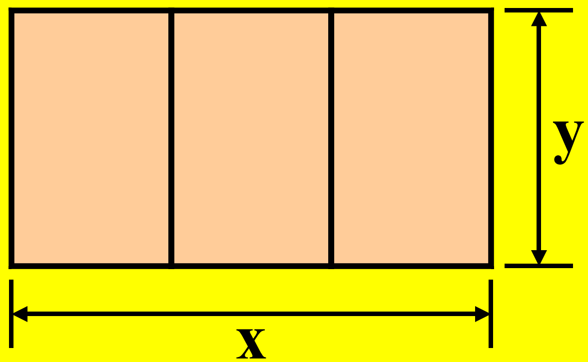

$$A = xy$$

$$A = x\left(\frac{-1}{2}x + 250\right)$$

$$A = \frac{-1}{2}x^2 + 250x$$

Find the vertex !!

$$A = \frac{-1}{2}(x^2 - 500x)$$

$$A - 31{,}250 = \frac{-1}{2}(x^2 - 500x + 62{,}500)$$

$$A - 31{,}250 = \frac{-1}{2}(x - 250)^2$$

Vertex: $(\underline{250}\,,\ \underline{31{,}250})$

x A

$$2x + 4y = 1000$$

$$4y = -2x + 1000$$

$$y = \frac{-1}{2}x + 250$$

$$x = 250 \Rightarrow y = \frac{-1}{2}(250) + 250$$

Algebra II Class Worksheet #2 Unit 8

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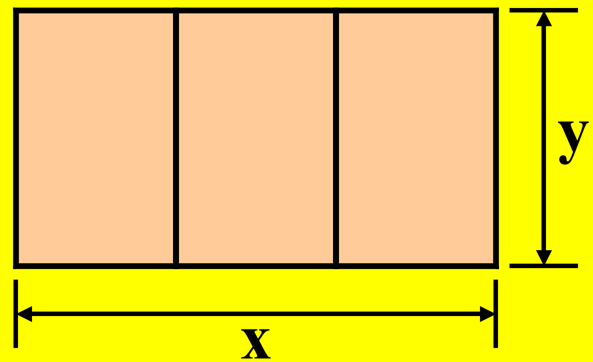

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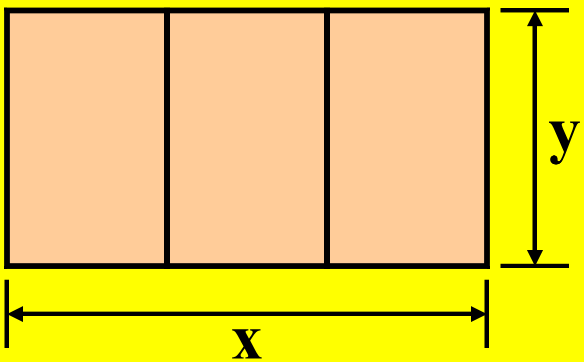

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Algebra II Class Worksheet #2 Unit 8

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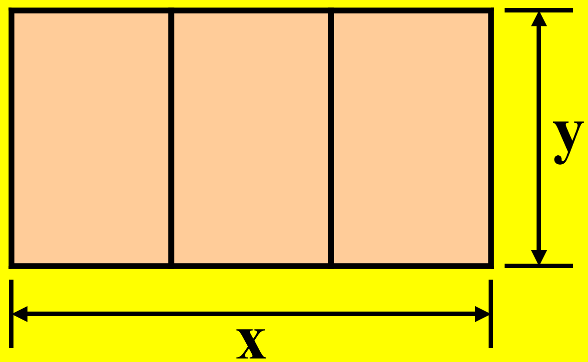

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Vertex: $(\underset{x}{\underline{250}}, \underset{A}{\underline{31{,}250}})$

$$x = 250 \Rightarrow y = \frac{-1}{2}(250) + 250$$

$$y = 125$$

The total area enclosed is a maximum if the plot is 250 feet long and 125 feet wide.

Algebra II Class Worksheet #2 Unit 8

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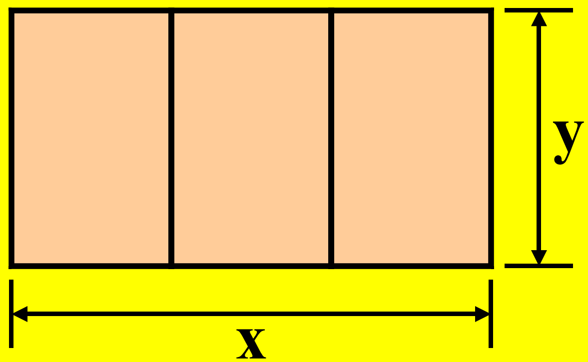

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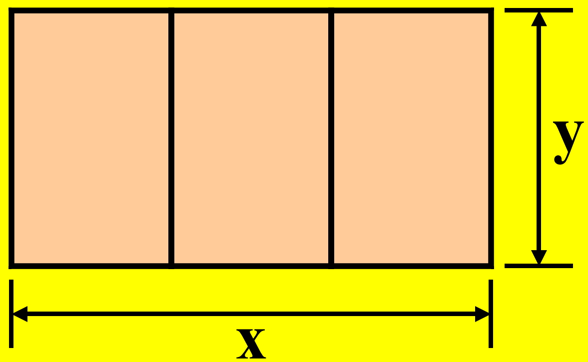

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The total area enclosed is a maximum if the plot is 250 feet long and 125 feet wide. The maximum area is 31,250 square feet.

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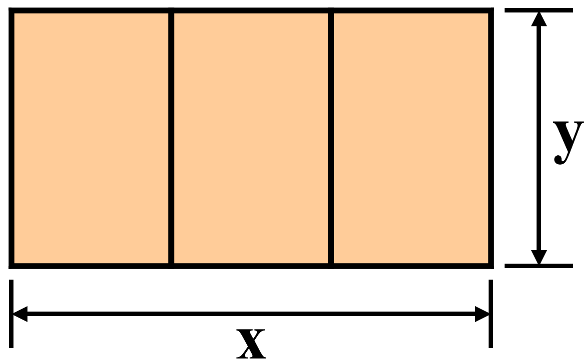

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Algebra II Class Worksheet #2 Unit 8

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I = (number of units rented)(monthly rental charge)

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Then, the number of units rented is 40 – x.

Algebra II Class Worksheet #2 Unit 8

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Also, the monthly rental charge (in dollars) is 600 + 20x.

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Number
Vacant

x

Make sure you understand this.

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Number Vacant	Number Rented
x	40 – x

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Number Vacant	Number Rented	Monthly Charge (\$)
x	$40 – x$	$600 + 20x$

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Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
0		

Make sure you understand this.

If x = 0,

Algebra II Class Worksheet #2 Unit 8

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Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
0	40 – 0 = 40	

Make sure you <u>understand</u> this.

If x = 0, there are 40 units rented

Algebra II Class Worksheet #2 Unit 8

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Then, the number of units rented is 40 – x.

Also, the monthly rental charge (in dollars) is 600 + 20x.

Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
0	40 – 0 = 40	600 + 20(0) = 600

Make sure you <u>understand</u> this.

If x = 0, there are 40 units rented and the monthly charge is $600.

Algebra II Class Worksheet #2 Unit 8

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Number Vacant	Number Rented	Monthly Charge (\$)
x	$40 - x$	$600 + 20x$
0	$40 - 0 = 40$	$600 + 20(0) = 600$

Make sure you understand this.

If x = 0, there are 40 units rented and the monthly charge is \$600.

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Make sure you understand this.

Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
0	40 – 0 = 40	600 + 20(0) = 600
1		

If x = 1,

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Make sure you understand this.

Number Vacant	Number Rented	Monthly Charge (\$)
x	40 – x	600 + 20x
0	40 – 0 = 40	600 + 20(0) = 600
1	40 – 1 = 39	

If x = 1, there are 39 units rented

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Make sure you understand this.

Number Vacant	Number Rented	Monthly Charge (\$)
x	40 – x	600 + 20x
0	40 – 0 = 40	600 + 20(0) = 600
1	40 – 1 = 39	600 + 20(1) = 620

If x = 1, there are 39 units rented and the monthly charge is \$620.

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Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
0	40 – 0 = 40	600 + 20(0) = 600
1	40 – 1 = 39	600 + 20(1) = 620

Make sure you understand this.

If x = 1, there are 39 units rented and the monthly charge is $620.

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Number Vacant	Number Rented	Monthly Charge (\$)
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Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
1	40 – 1 = 39	600 + 20(1) = 620

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Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
1	40 – 1 = 39	600 + 20(1) = 620
2		

If x = 2,

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Make sure you <u>understand</u> this.

Number Vacant	Number Rented	Monthly Charge (\$)
x	40 – x	600 + 20x
1	40 – 1 = 39	600 + 20(1) = 620
2	40 – 2 = 38	

If x = 2, there are 38 units rented

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of units rented)(monthly rental charge)

This is a common type of problem situation.

Let x represent the number of vacant units.

Then, the number of units rented is 40 – x.

Also, the monthly rental charge (in dollars) is 600 + 20x.

Make sure you understand this.

Number Vacant	Number Rented	Monthly Charge ($)
x	40 – x	600 + 20x
1	40 – 1 = 39	600 + 20(1) = 620
2	40 – 2 = 38	600 + 20(2) = 640

If x = 2, there are 38 units rented and the monthly charge is $640.

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Rearrange the terms, and combine like terms.

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Express the function in 'vertex form'.

Given any 2nd degree function with one variable, $y = f(x) = Ax^2 + Bx + C$, the 'vertex form' of the equation is $y - y_1 = A(x - x_1)^2$.

The vertex of the function is (x_1, y_1) !!!

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Vertex: (<u>5</u> ,

Express the function in 'vertex form'.

Given any 2nd degree function with one variable, $y = f(x) = Ax^2 + Bx + C$, the 'vertex form' of the equation is $y - y_1 = A(x - x_1)^2$.

The vertex of the function is (x_1, y_1) !!!

Algebra II Class Worksheet #2 Unit 8

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They should charge \$700 per month.

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The maximum monthly income is \$24,500.

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Vertex: $(\underset{x}{\underline{5}}, \underset{I}{\underline{24{,}500}})$

They should charge \$700 per month.

The maximum monthly income is \$24,500.

$600 + 20x =$

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Algebra II Class Worksheet #2 Unit 8

4. A television set manufacturer can sell 200 sets per month for $800 per set. Marketing research indicates that the company can sell 20 more sets per month for each $25 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

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This problem is similar to problem #3.

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Per Month
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Number Sold Per Month	Price per TV ($)
200 + 20x	

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$200 + 20x$	800

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Value of x	Number Sold Per Month	Price per TV ($)
	$200 + 20x$	$800 - 25x$

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Value of x	Number Sold Per Month $200 + 20x$	Price per TV ($) $800 – 25x$
0		

If $x = 0$,

Algebra II Class Worksheet #2 Unit 8

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We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	

If x = 0, there are 200 TV’s sold per month

Algebra II Class Worksheet #2 Unit 8

4. A television set manufacturer can sell 200 sets per month for $800 per set. Marketing research indicates that the company can sell 20 more sets per month for each $25 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?

We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.

We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800

If x = 0, there are 200 TV's sold per month, and the price is $800 per set.

Algebra II Class Worksheet #2 Unit 8

4. A television set manufacturer can sell 200 sets per month for $800 per set. Marketing research indicates that the company can sell 20 more sets per month for each $25 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?

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We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800

If x = 0, there are 200 TV's sold per month, and the price is $800 per set.

Algebra II Class Worksheet #2 Unit 8

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Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.
We will represent the number of TV's sold per month as $200 + 20x$.
We will represent the price per television set as $800 – 25x$ (dollars)

Value of x	Number Sold Per Month $200 + 20x$	Price per TV ($) $800 – 25x$
0	$200 + 0 = 200$	$800 – 0 = 800$
1		

If $x = 1$,

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.

We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	

If x = 1, there are 220 TV's sold per month,

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.

We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775

If x = 1, there are 220 TV's sold per month, and the price is $775 per set.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.
We will represent the number of TV's sold per month as 200 + 20x.
We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775

If x = 1, there are 220 TV's sold per month, and the price is $775 per set.

Algebra II Class Worksheet #2 Unit 8

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We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.
We will represent the number of TV's sold per month as 200 + 20x.
We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775
2		

If x = 2,

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.
We will represent the number of TV's sold per month as 200 + 20x.
We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775
2	200 + 40 = 240	

If x = 2, there are 240 TV’s sold per month,

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.

We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775
2	200 + 40 = 240	800 – 50 = 750

If x = 2, there are 240 TV’s sold per month, and the price is $750 per set.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

This problem is similar to problem #3.

We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775
2	200 + 40 = 240	800 – 50 = 750

If x = 2, there are 240 TV’s sold per month, and the price is $750 per set.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

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We will represent the number of TV's sold per month as 200 + 20x.

We will represent the price per television set as 800 – 25x (dollars)

Value of x	Number Sold Per Month 200 + 20x	Price per TV ($) 800 – 25x
0	200 + 0 = 200	800 – 0 = 800
1	200 + 20 = 220	800 – 25 = 775
2	200 + 40 = 240	800 – 50 = 750

It works!

If x = 2, there are 240 TV’s sold per month, and the price is $750 per set.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month :

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x   Price per TV (\$) :

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV ($) : $800 - 25x$

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x   Price per TV ($) : 800 – 25x

I =

Algebra II Class Worksheet #2 Unit 8

4. A television set manufacturer can sell 200 sets per month for $800 per set. Marketing research indicates that the company can sell 20 more sets per month for each $25 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?

We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV ($) : $800 - 25x$

$I = (200 + 20x)$

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x)$$

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x) =$$

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV ($) : $800 – 25x$

$I = (200 + 20x)(800 – 25x) =$

Multiply.

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x   Price per TV ($) : 800 – 25x

$$I = (200 + 20x)(800 - 25x) = 160{,}000$$

Multiply.

Algebra II Class Worksheet #2 Unit 8

4. A television set manufacturer can sell 200 sets per month for $800 per set. Marketing research indicates that the company can sell 20 more sets per month for each $25 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?

We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x   Price per TV ($) : 800 – 25x

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x$$

Multiply.

Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x$$

Multiply.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Multiply.

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x   Price per TV ($) : 800 – 25x

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Algebra II Class Worksheet #2 Unit 8

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number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Rearrange the terms, and combine like terms.

Algebra II Class Worksheet #2 Unit 8

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I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : 200 + 20x Price per TV ($) : 800 – 25x

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

$$I =$$

Rearrange the terms, and combine like terms.

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

$$I = -500x^2$$

Rearrange the terms, and combine like terms.

Algebra II Class Worksheet #2 Unit 8

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

$$I = -500x^2$$

Rearrange the terms, and combine like terms.

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

$$I = -500x^2 + 11{,}000x$$

Rearrange the terms, and combine like terms.

Algebra II Class Worksheet #2 Unit 8

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

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Rearrange the terms, and combine like terms.

Algebra II Class Worksheet #2 Unit 8

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

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Algebra II Class Worksheet #2 Unit 8

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Algebra II Class Worksheet #2 Unit 8

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We need a function for the total monthly income, I.

I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 – 25x$

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

Algebra II Class Worksheet #2 Unit 8

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Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

Subtract 160,000 from each side.

Algebra II Class Worksheet #2 Unit 8

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Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

I

Subtract 160,000 from each side.

Algebra II Class Worksheet #2 Unit 8

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$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

$$I - 160{,}000$$

Subtract 160,000 from each side.

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I = (number of TV's sold per month)(price per TV)

number of TV's sold per month : $200 + 20x$ Price per TV (\$) : $800 - 25x$

$$I = (200 + 20x)(800 - 25x) = 160{,}000 - 5{,}000x + 16{,}000x - 500x^2$$

Find the vertex !!

$$I = -500x^2 + 11{,}000x + 160{,}000$$

$$I - 160{,}000 =$$

Subtract 160,000 from each side.

Algebra II Class Worksheet #2 Unit 8

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Subtract 160,000 from each side.

Algebra II Class Worksheet #2 Unit 8

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Algebra II Class Worksheet #2 Unit 8

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$800 - 25x =$

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They should charge \$525 per television set.

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The maximum monthly income is \$220,500.

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The maximum monthly income is $220,500.