

**General Algebra II**  
**Lesson #2 Unit 5**  
**Class Worksheet #2**  
**For Worksheets #3 & #4**

# **General Algebra II Unit 5 Introduction to Linear Programming**

**General Algebra II Unit 5 Introduction to Linear Programming**

**A farming family wishes to plant some barley and some wheat.**

## **General Algebra II Unit 5 Introduction to Linear Programming**

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat.**

## **General Algebra II Unit 5 Introduction to Linear Programming**

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting.**

## General Algebra II Unit 5 Introduction to Linear Programming

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds.**

## General Algebra II Unit 5 Introduction to Linear Programming

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs.**

## General Algebra II Unit 5 Introduction to Linear Programming

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat.**



## General Algebra II Unit 5 Introduction to Linear Programming

**A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?**

## **General Algebra II Unit 5 Introduction to Linear Programming**

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

## **General Algebra II Unit 5 Introduction to Linear Programming**

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

Let  $x$  represent the number of acres of barley that they plant.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

Let  $x$  represent the number of acres of barley that they plant.

Let  $y$  represent the number of acres of wheat that they plant.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

Let  $x$  represent the number of acres of barley that they plant.

Let  $y$  represent the number of acres of wheat that they plant.

This can be represented in table form.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

Let  $x$  represent the number of acres of barley that they plant.

Let  $y$  represent the number of acres of wheat that they plant.

This can be represented in table form.

acres

barley

wheat

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

Let  $x$  represent the number of acres of barley that they plant.

Let  $y$  represent the number of acres of wheat that they plant.

This can be represented in table form.

	acres
barley	$x$
wheat	$y$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow$   $x \leq 100$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow$   $x \leq 100$

Since they can plant a maximum of 80 acres of wheat

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres

barley     $x$

wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres  
barley     $x$   
wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.

Wheat costs \$30 per acre for seeds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

acres  
barley     $x$   
wheat     $y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.

Wheat costs \$30 per acre for seeds.

$\Rightarrow$  It will cost  $30y$  dollars for enough seeds to plant  $y$  acres of wheat.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	
wheat	$y$	

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.

Wheat costs \$30 per acre for seeds.

$\Rightarrow$  It will cost  $30y$  dollars for enough seeds to plant  $y$  acres of wheat.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.

Wheat costs \$30 per acre for seeds.

$\Rightarrow$  It will cost  $30y$  dollars for enough seeds to plant  $y$  acres of wheat.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Barley costs \$20 per acre for seeds.

$\Rightarrow$  It will cost  $20x$  dollars for enough seeds to plant  $x$  acres of barley.

Wheat costs \$30 per acre for seeds.

$\Rightarrow$  It will cost  $30y$  dollars for enough seeds to plant  $y$  acres of wheat.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Since they only have \$3000 available for seed costs

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Since they only have \$3000 available for seed costs  $\Rightarrow 20x + 30y \leq 3000$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

Since they only have \$3000 available for seed costs  $\Rightarrow 20x + 30y \leq 3000$

Since  $x$  and  $y$  represent non-negative numbers

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Since they can plant a maximum of 100 acres of barley  $\Rightarrow x \leq 100$

Since they can plant a maximum of 80 acres of wheat  $\Rightarrow y \leq 80$

Since they only have 120 acres available for planting  $\Rightarrow x + y \leq 120$

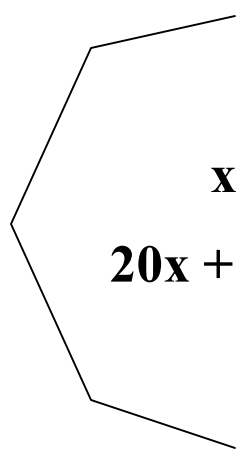
Since they only have \$3000 available for seed costs  $\Rightarrow 20x + 30y \leq 3000$

Since  $x$  and  $y$  represent non-negative numbers  $\left\{ \begin{array}{l} \Rightarrow x \geq 0 \\ \Rightarrow y \geq 0 \end{array} \right.$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

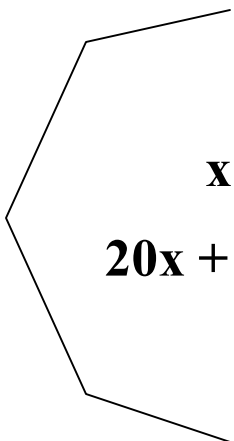

$$\begin{aligned}x &\leq 100 \\y &\leq 80 \\x + y &\leq 120 \\20x + 30y &\leq 3000 \\x &\geq 0 \\y &\geq 0\end{aligned}$$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

**System  
of  
constraints**

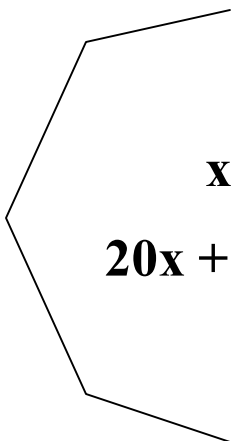

$$\begin{aligned}x &\leq 100 \\y &\leq 80 \\x + y &\leq 120 \\20x + 30y &\leq 3000 \\x &\geq 0 \\y &\geq 0\end{aligned}$$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

**System  
of  
constraints**


$$\begin{aligned}x &\leq 100 \\y &\leq 80 \\x + y &\leq 120 \\20x + 30y &\leq 3000 \\x &\geq 0 \\y &\geq 0\end{aligned}$$

Graph this system to find the set of **feasible solutions** for the problem.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

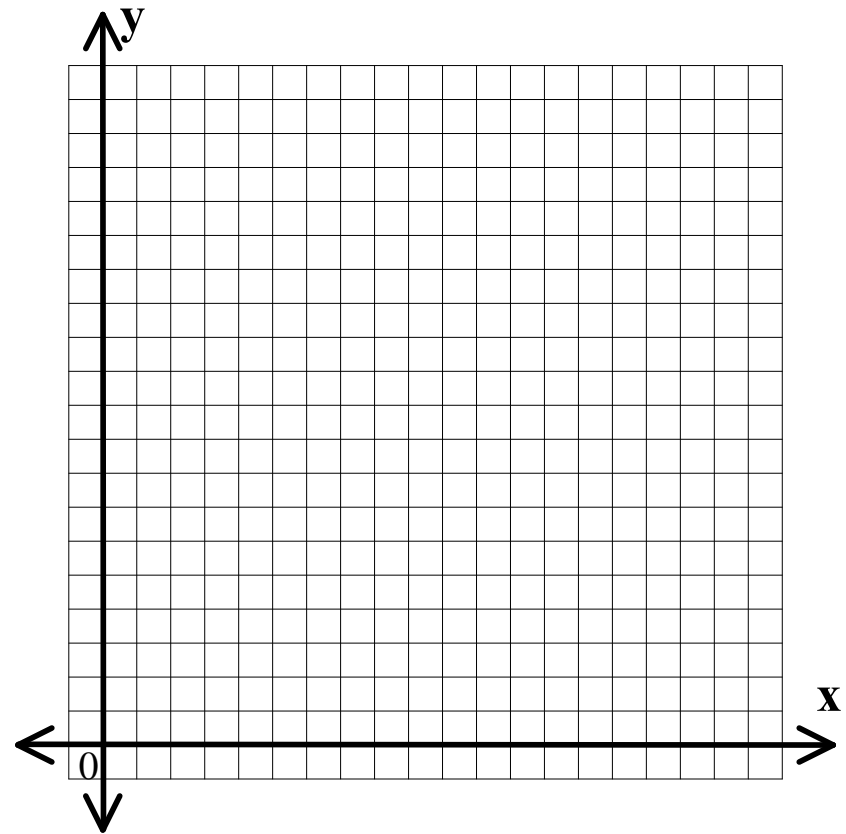
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120$$

$$20x + 30y \leq 3000$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

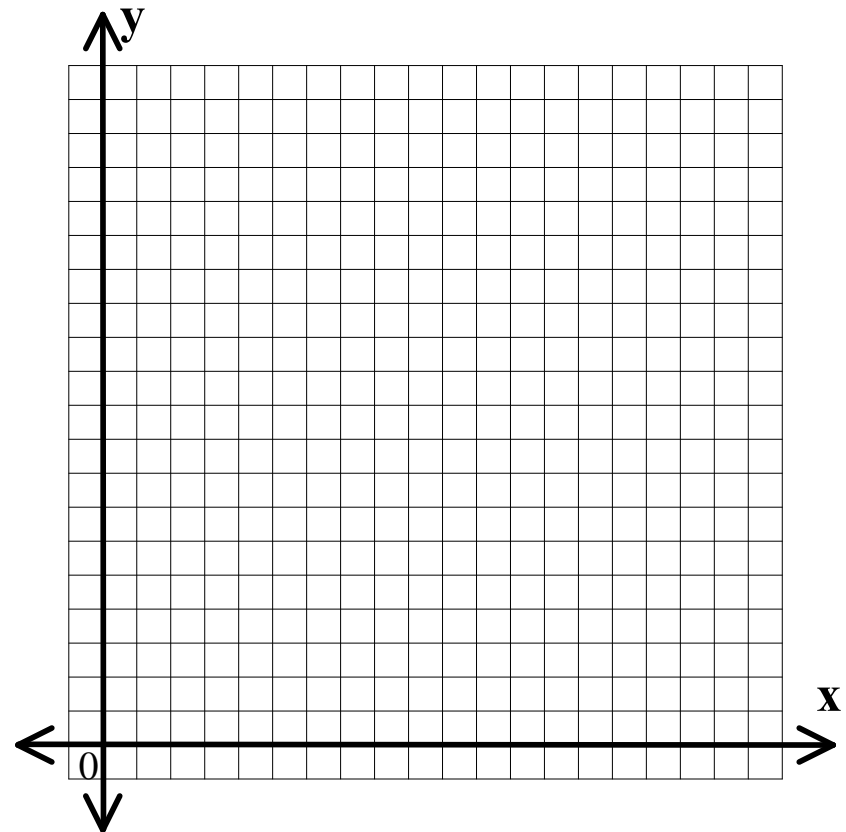
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

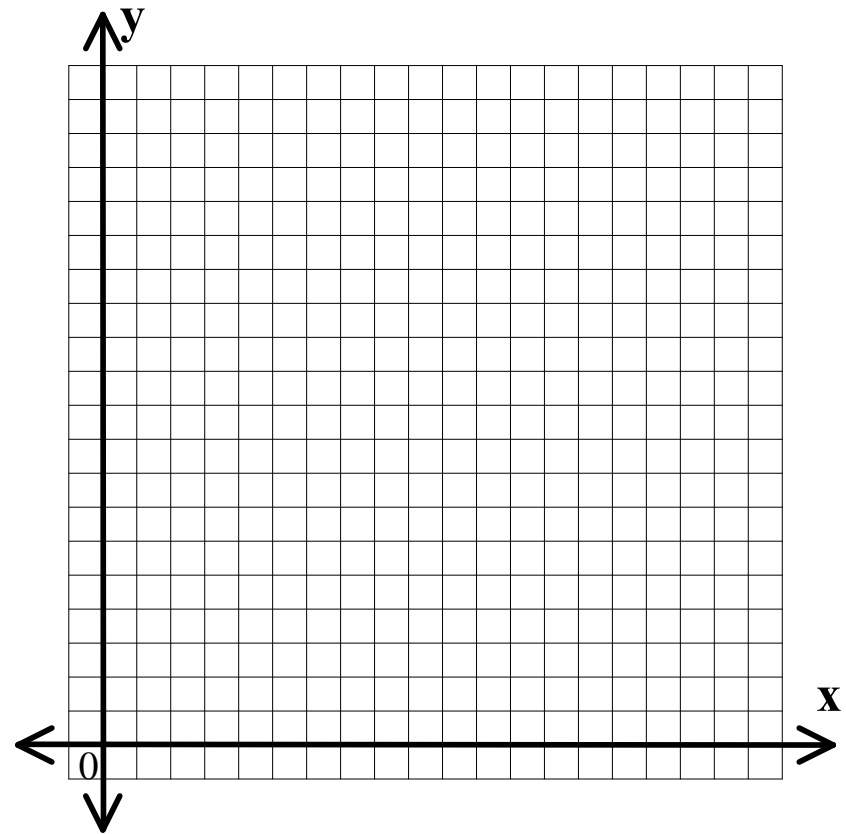
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000 \implies y \leq \frac{-2}{3}x + 100$$





## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

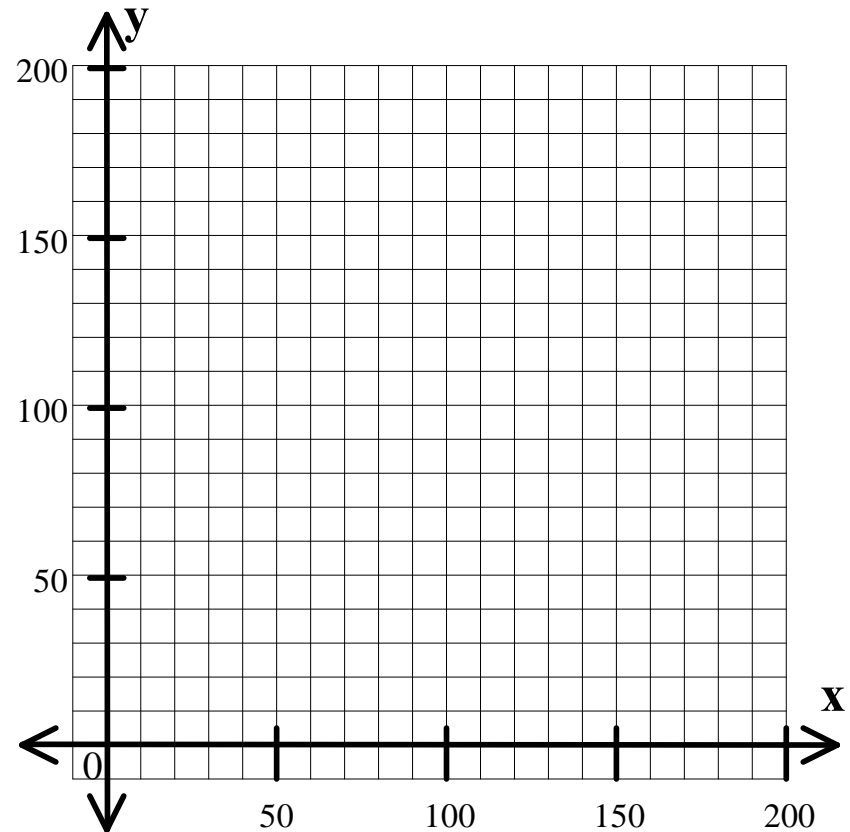
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000 \implies y \leq \frac{-2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

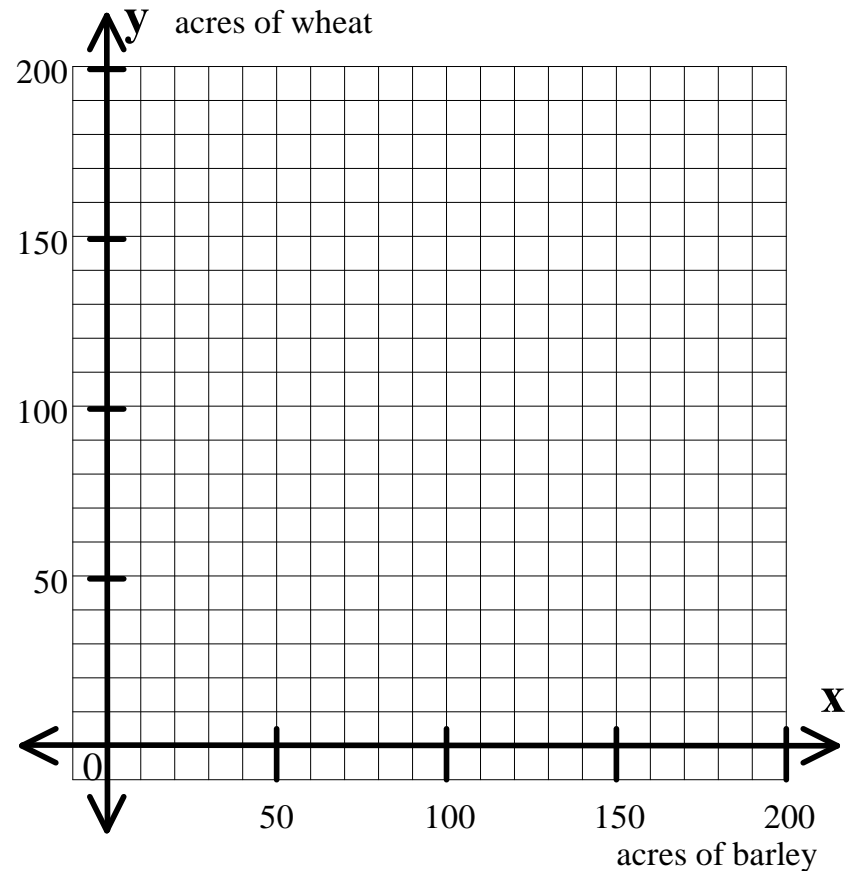
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000 \implies y \leq \frac{-2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

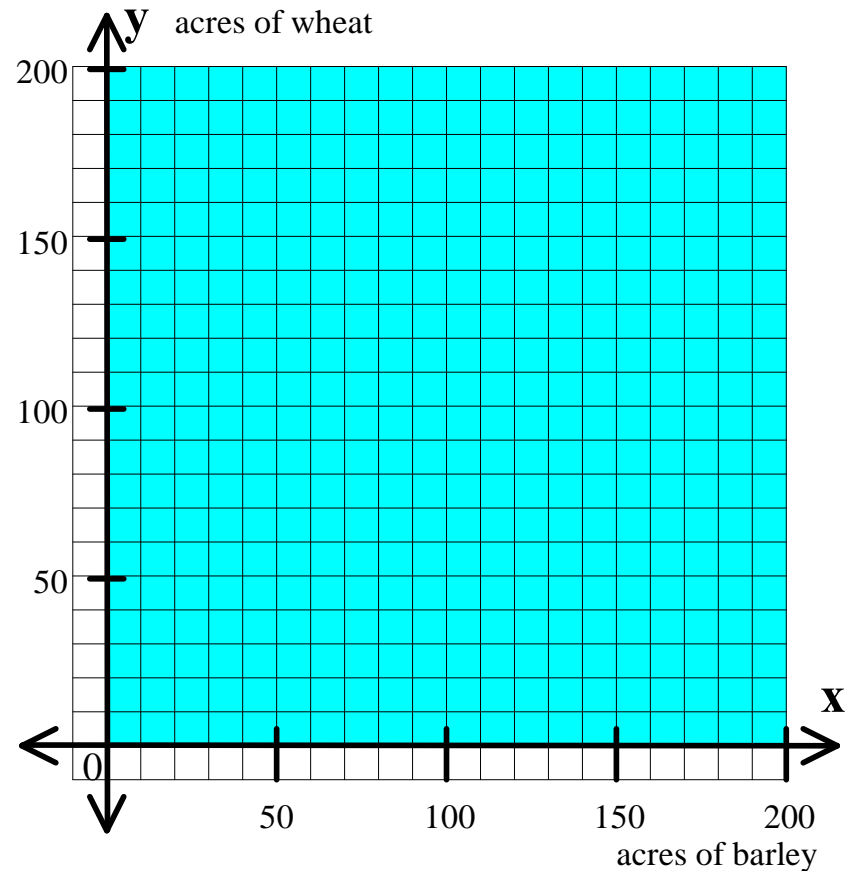
$$y \geq 0 \quad \checkmark$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq \frac{-2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

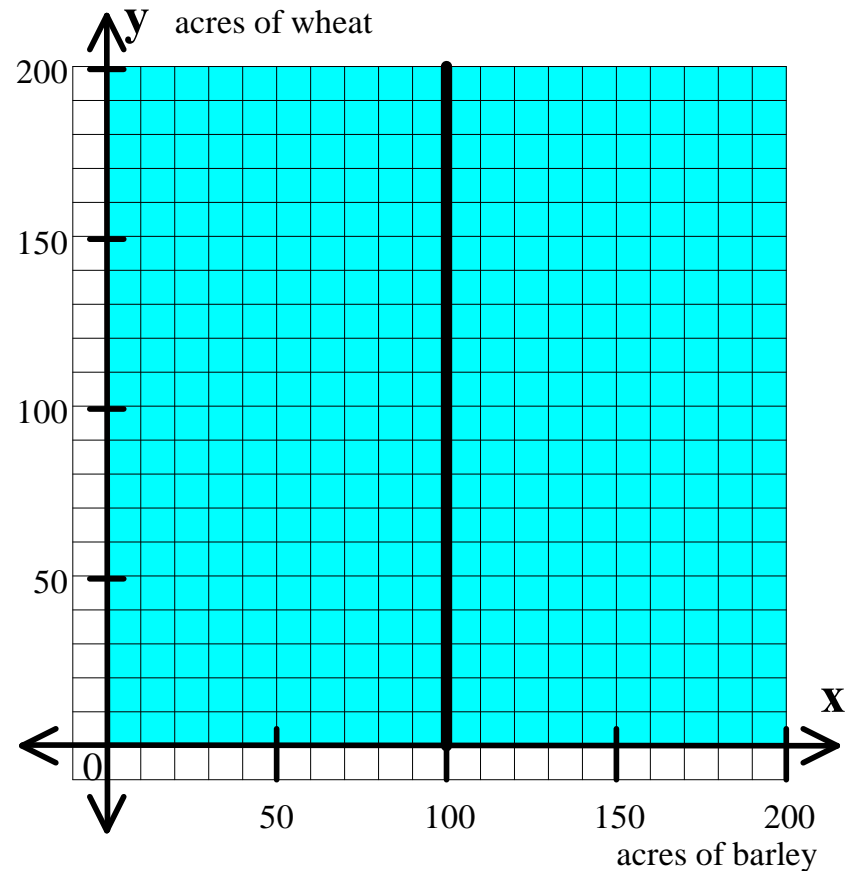
$$y \geq 0 \quad \checkmark$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq \frac{-2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

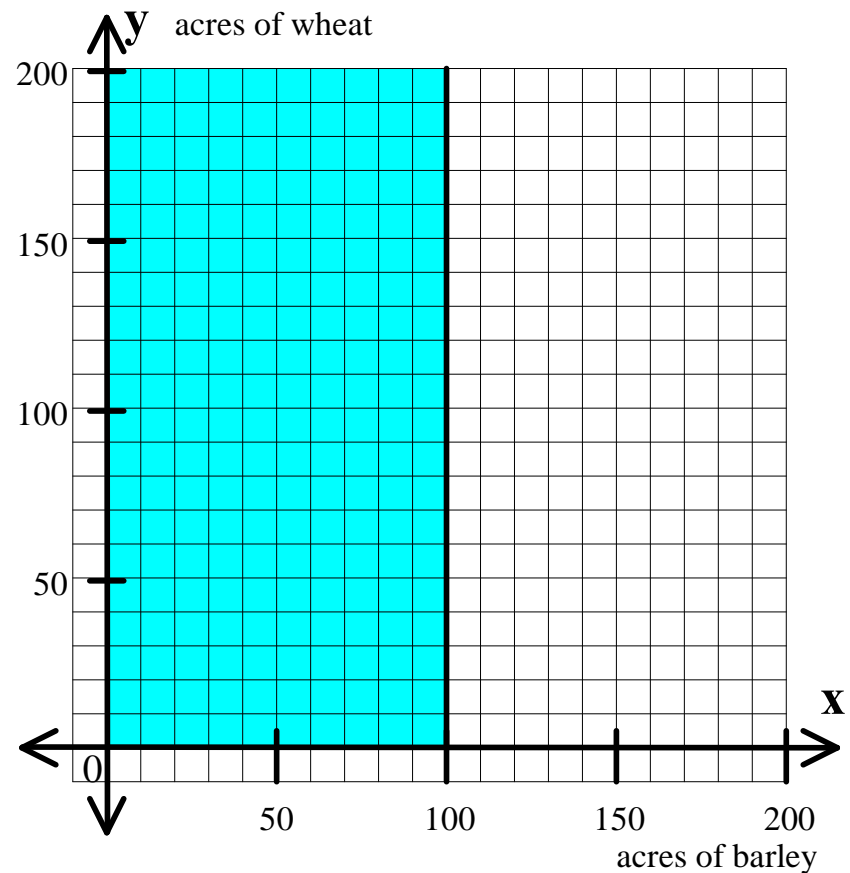
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

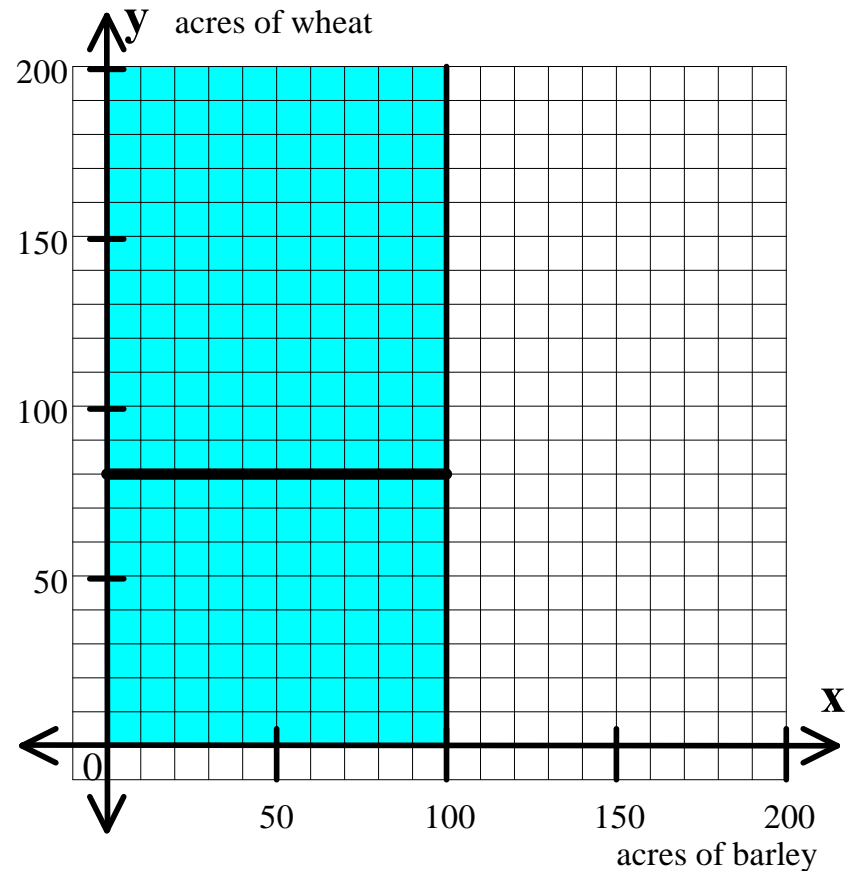
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

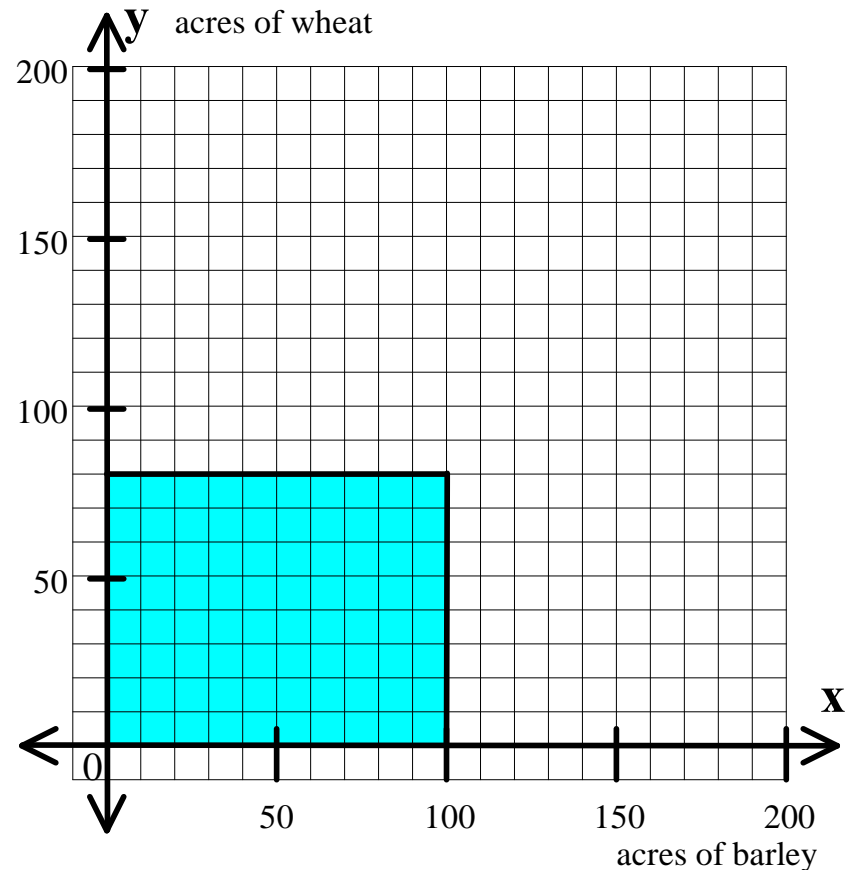
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80 \quad \checkmark$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

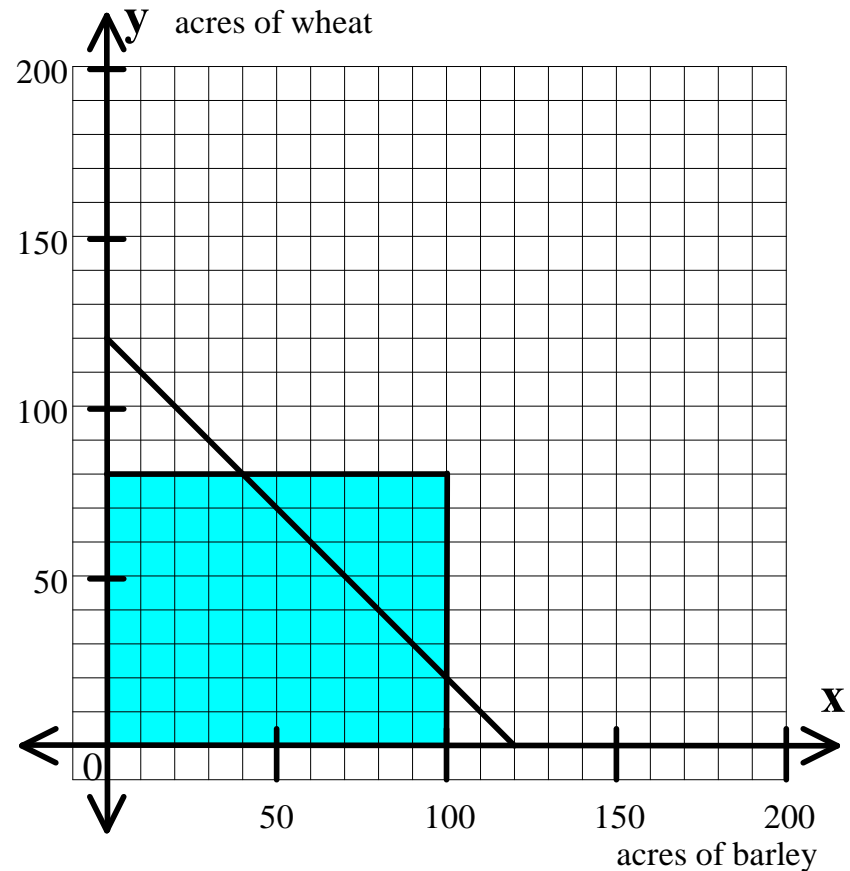
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80 \quad \checkmark$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$





## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

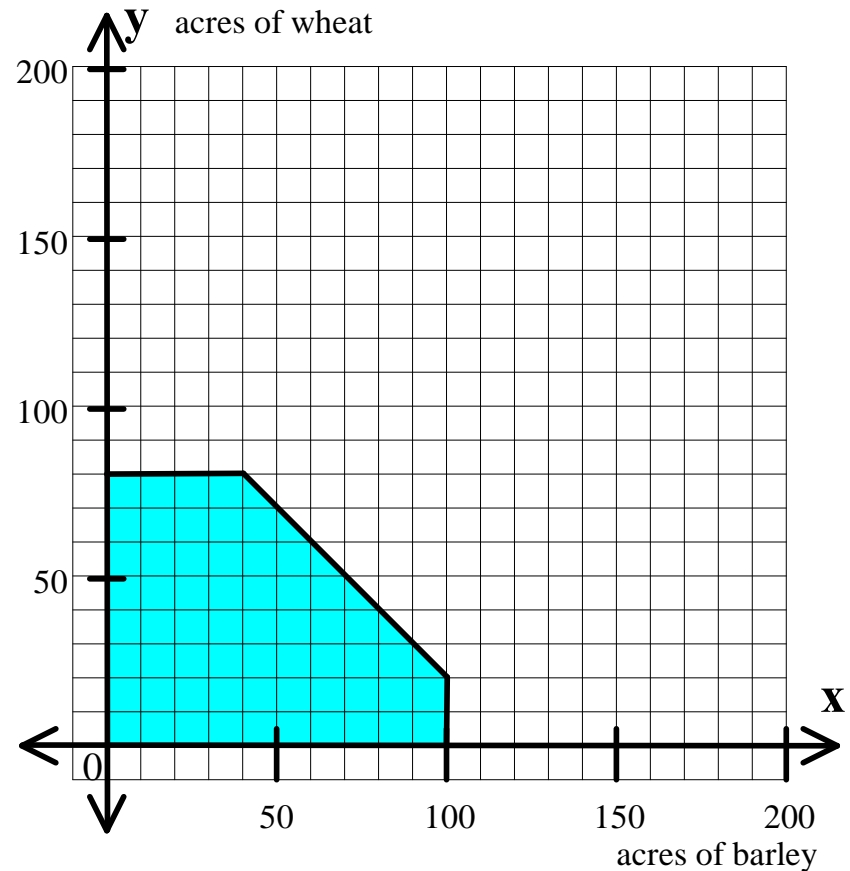
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80 \quad \checkmark$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120 \quad \checkmark$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

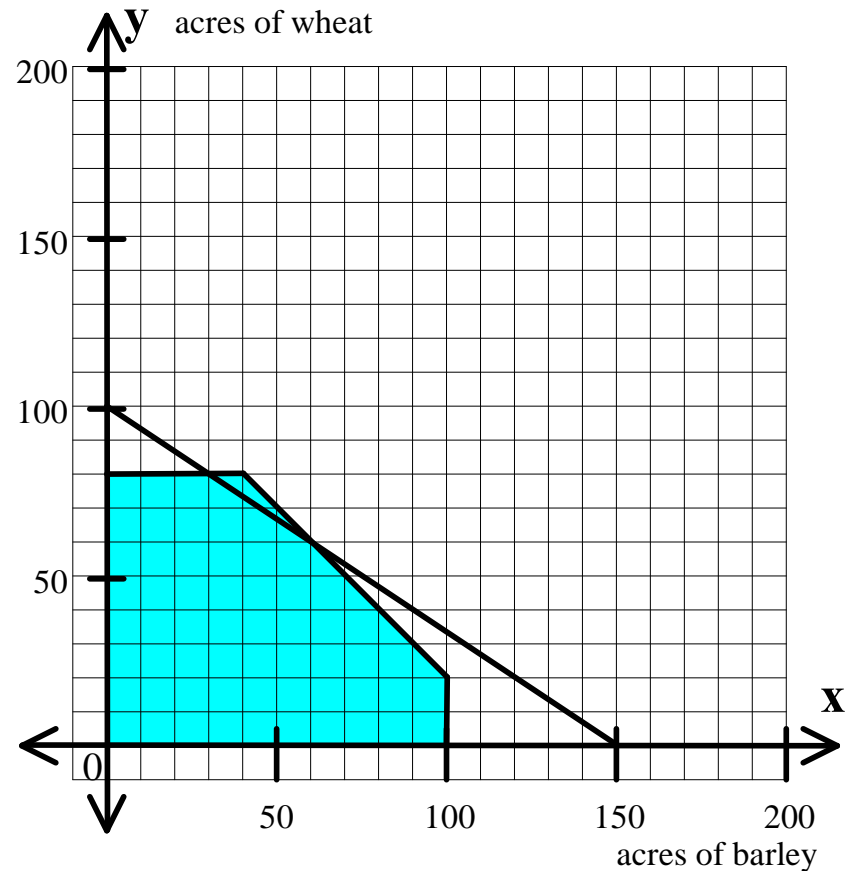
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80 \quad \checkmark$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120 \quad \checkmark$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0 \quad \checkmark$$

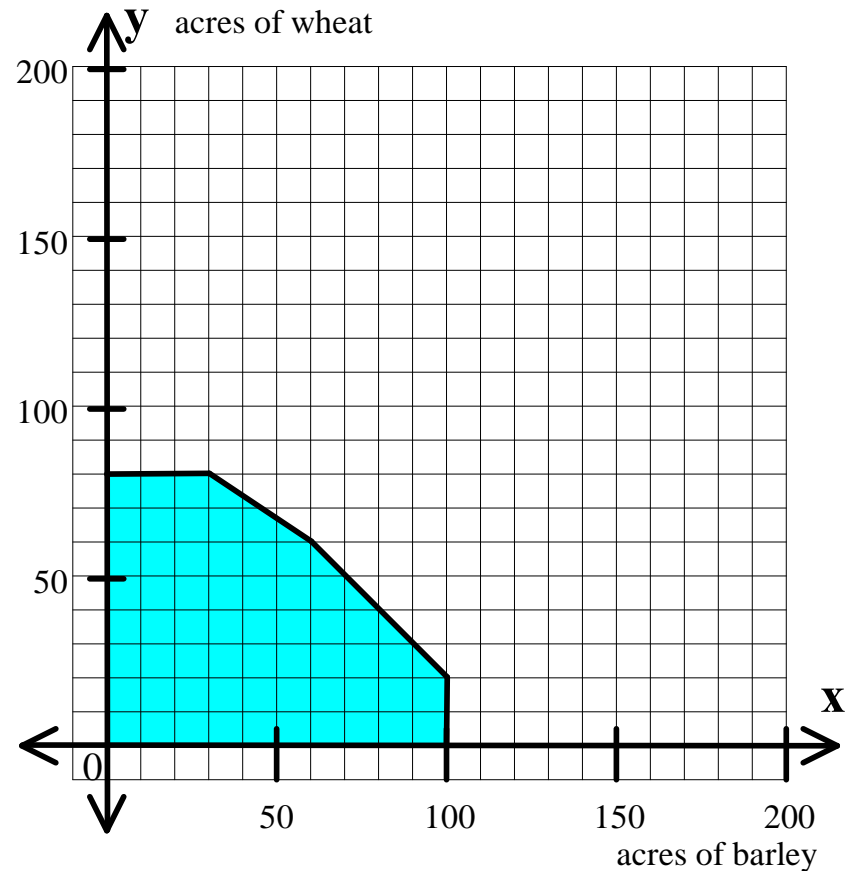
$$y \geq 0 \quad \checkmark$$

$$x \leq 100 \quad \checkmark$$

$$y \leq 80 \quad \checkmark$$

$$x + y \leq 120 \quad \Rightarrow \quad y \leq -x + 120 \quad \checkmark$$

$$20x + 30y \leq 3000 \quad \Rightarrow \quad y \leq -\frac{2}{3}x + 100 \quad \checkmark$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

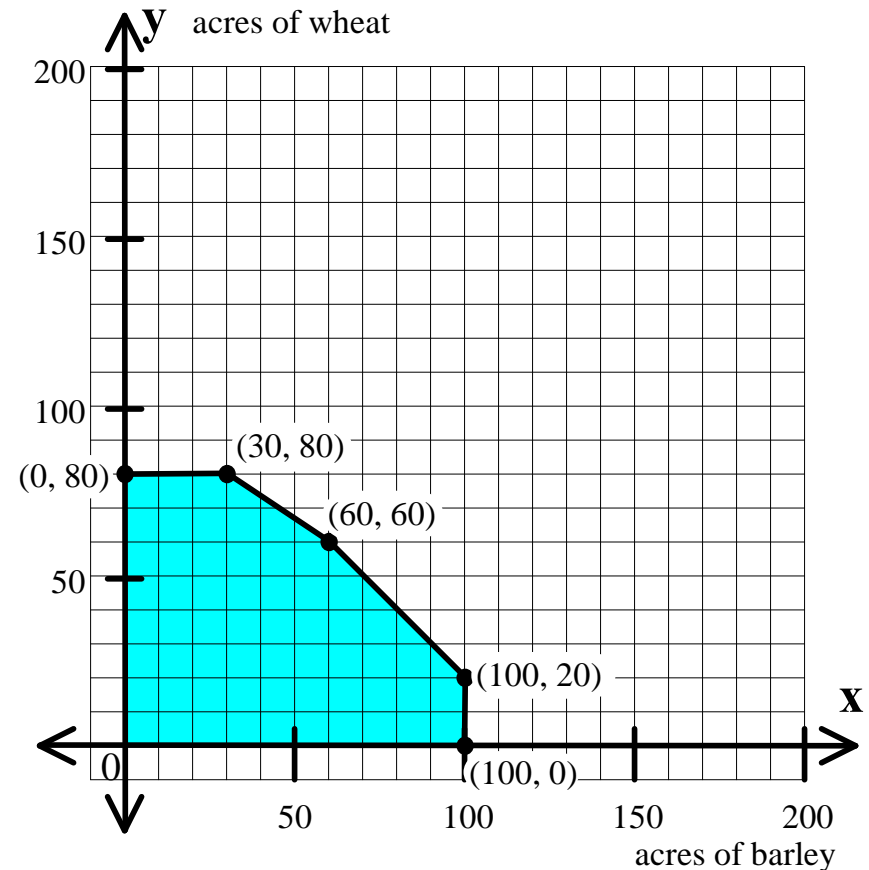
$$y \geq 0$$

$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000 \implies y \leq \frac{-2}{3}x + 100$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

$$x \geq 0$$

$$y \geq 0$$

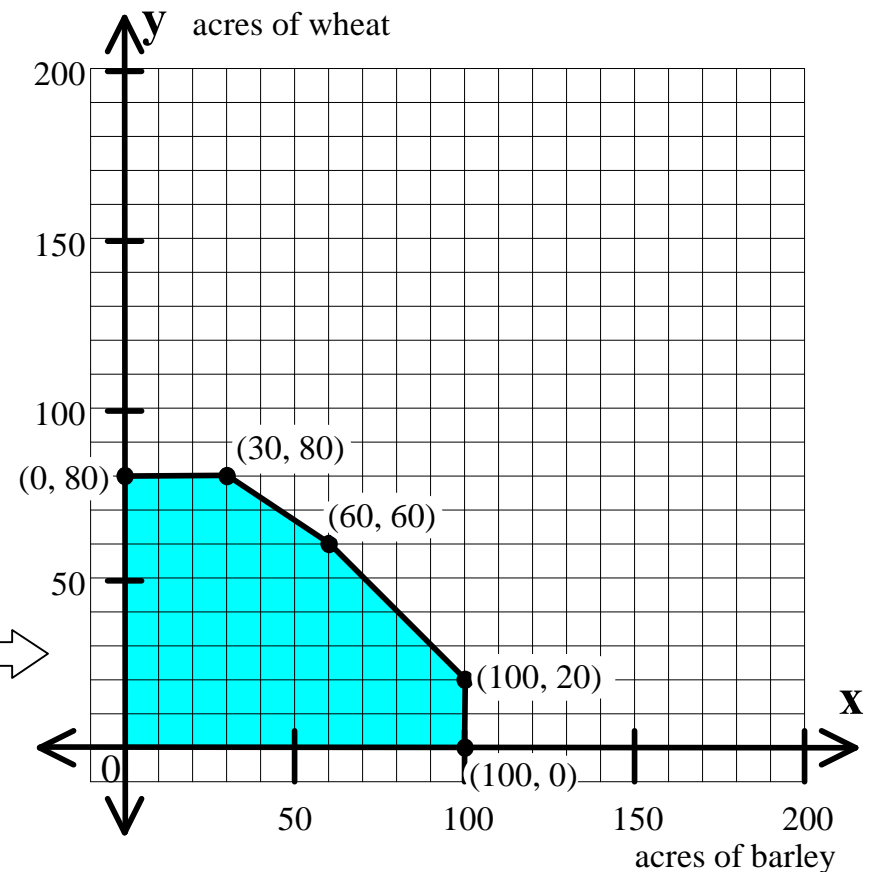
$$x \leq 100$$

$$y \leq 80$$

$$x + y \leq 120 \implies y \leq -x + 120$$

$$20x + 30y \leq 3000 \implies y \leq \frac{-2}{3}x + 100$$

the set of feasible solutions  $\implies$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Consider the total harvest.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Consider the total harvest.

They expect 1000 pounds per acre of Barley.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.

They expect **3000 pounds per acre** of **Wheat**.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost
barley	$x$	$20x$
wheat	$y$	$30y$

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.

They expect **3000 pounds per acre** of **Wheat**.

⇒ The total expected harvest of **Wheat** is **3000y** pounds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	
wheat	$y$	$30y$	

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.

They expect **3000 pounds per acre** of **Wheat**.

⇒ The total expected harvest of **Wheat** is **3000y** pounds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.

They expect **3000 pounds per acre** of **Wheat**.

⇒ The total expected harvest of **Wheat** is **3000y** pounds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

Consider the total harvest.

They expect **1000 pounds per acre** of **Barley**.

⇒ The total expected harvest of **Barley** is **1000x** pounds.

They expect **3000 pounds per acre** of **Wheat**.

⇒ The total expected harvest of **Wheat** is **3000y** pounds.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

The total harvest of both crops can be represented by the equation

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	20x	1000x
wheat	y	30y	3000y

The total harvest of both crops can be represented by the equation

$$\mathbf{T = 1000x + 3000y}$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	20x	1000x
wheat	y	30y	3000y

The total harvest of both crops can be represented by the equation

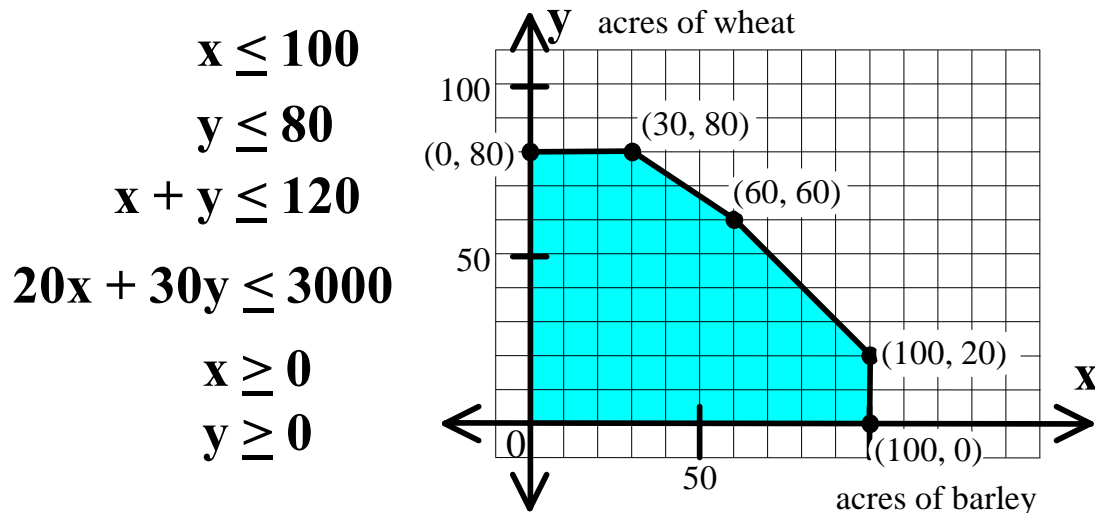
$$T = 1000x + 3000y$$

This is called the objective function.

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

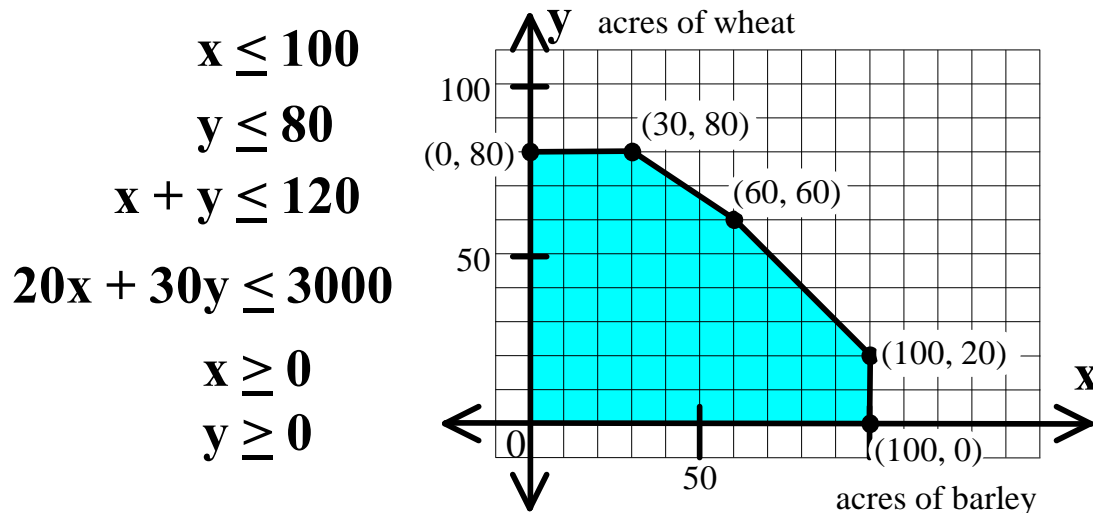
	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest	
barley	$x$	$20x$	$1000x$	$T = 1000x + 3000y$
wheat	$y$	$30y$	$3000y$	



## General Algebra II Unit 5 Introduction to Linear Programming

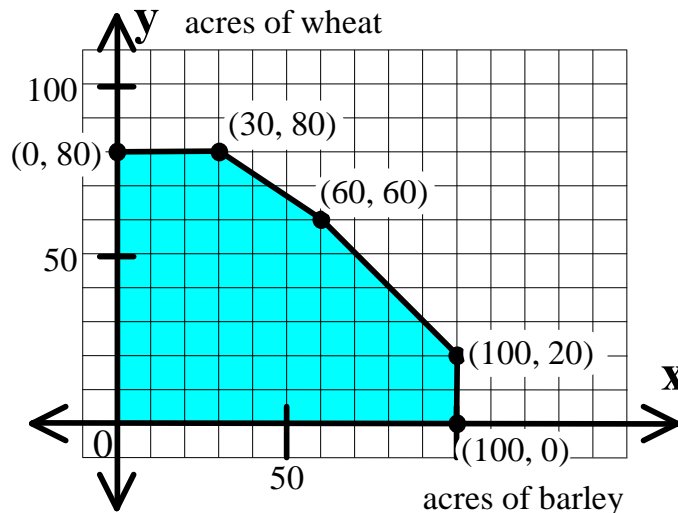
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned}x &\leq 100 \\y &\leq 80 \\x + y &\leq 120 \\20x + 30y &\leq 3000 \\x &\geq 0 \\y &\geq 0\end{aligned}$$



## General Algebra II Unit 5 Introduction to Linear Programming

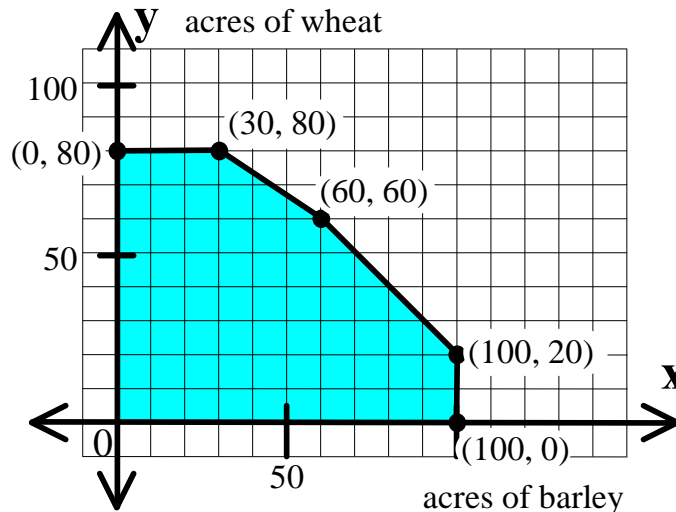
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At (30,80)

## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

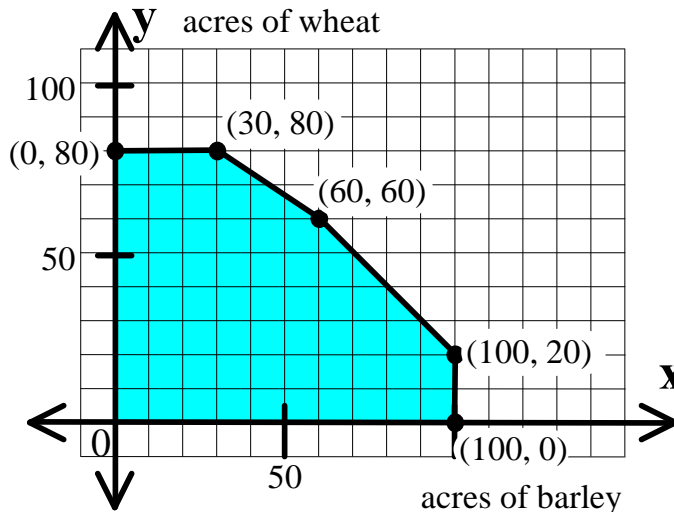
	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

At  $(30, 80) \implies T = 30,000 + 240,000$

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



## General Algebra II Unit 5 Introduction to Linear Programming

A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

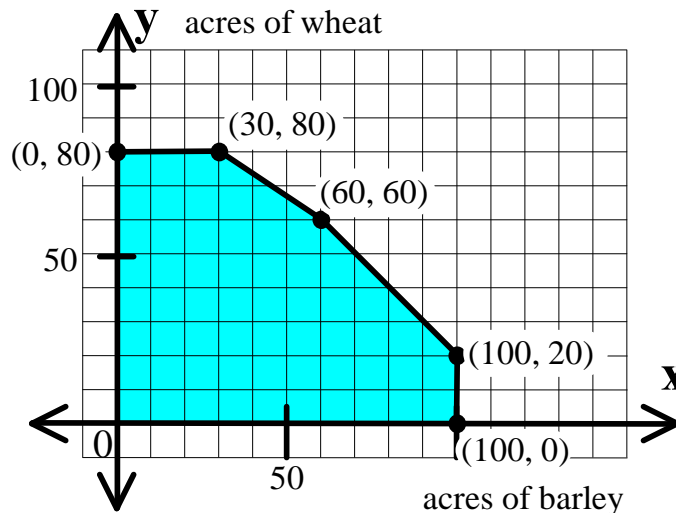
$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

At  $(30, 80) \implies T = 30,000 + 240,000$

$$T = 270,000$$

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



## General Algebra II Unit 5 Introduction to Linear Programming

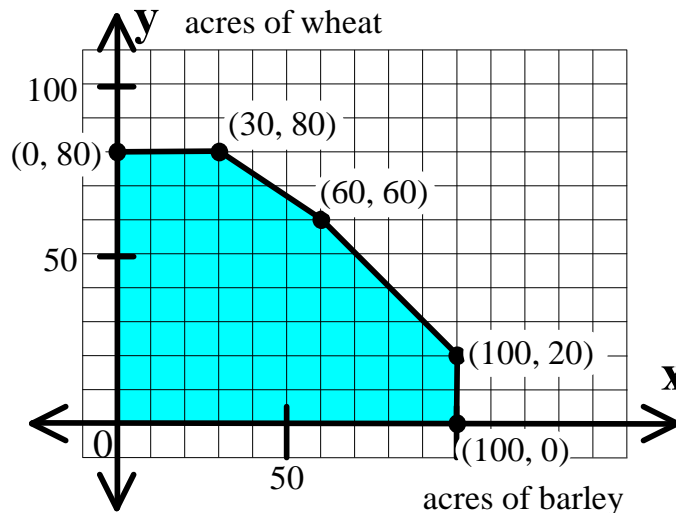
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At  $(30,80) \implies T = 30,000 + 240,000$

$$T = 270,000$$

At  $(60,60)$



## General Algebra II Unit 5 Introduction to Linear Programming

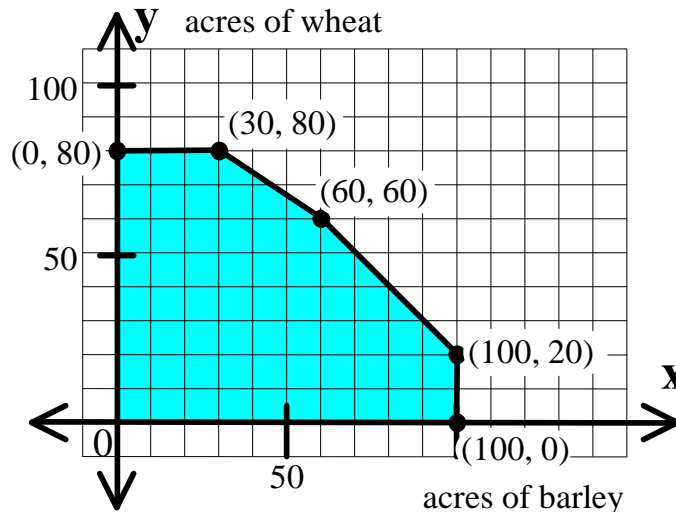
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At  $(30, 80) \Rightarrow T = 30,000 + 240,000$

$$T = 270,000$$

At  $(60, 60) \Rightarrow T = 60,000 + 180,000$

## General Algebra II Unit 5 Introduction to Linear Programming

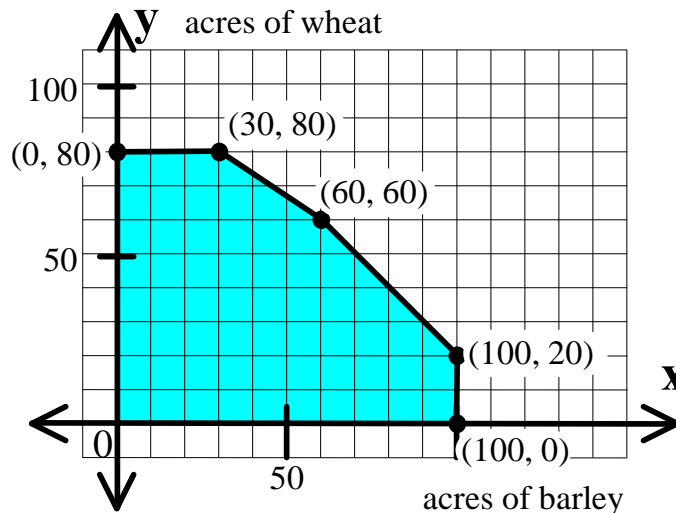
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	$20x$	$1000x$
wheat	y	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of T will occur at a vertex of the region.

$$\begin{aligned}
 x &\leq 100 \\
 y &\leq 80 \\
 x + y &\leq 120 \\
 20x + 30y &\leq 3000 \\
 x &\geq 0 \\
 y &\geq 0
 \end{aligned}$$



$$\begin{aligned}
 \text{At } (30,80) &\quad \Rightarrow T = 30,000 + 240,000 \\
 &\quad \quad \quad T = 270,000 \\
 \text{At } (60,60) &\quad \Rightarrow T = 60,000 + 180,000 \\
 &\quad \quad \quad T = 240,000
 \end{aligned}$$

## General Algebra II Unit 5 Introduction to Linear Programming

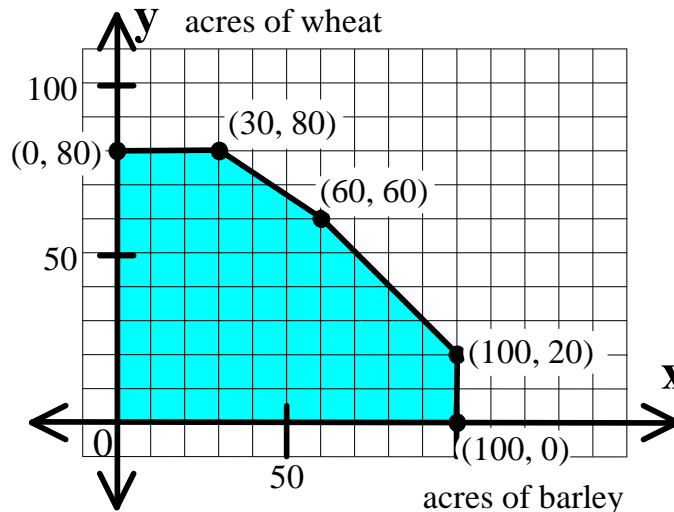
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	$20x$	$1000x$
wheat	y	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of T will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At (30,80)  $\Rightarrow T = 30,000 + 240,000$

$$T = 270,000$$

At (60,60)  $\Rightarrow T = 60,000 + 180,000$

$$T = 240,000$$

At (100,20)

## General Algebra II Unit 5 Introduction to Linear Programming

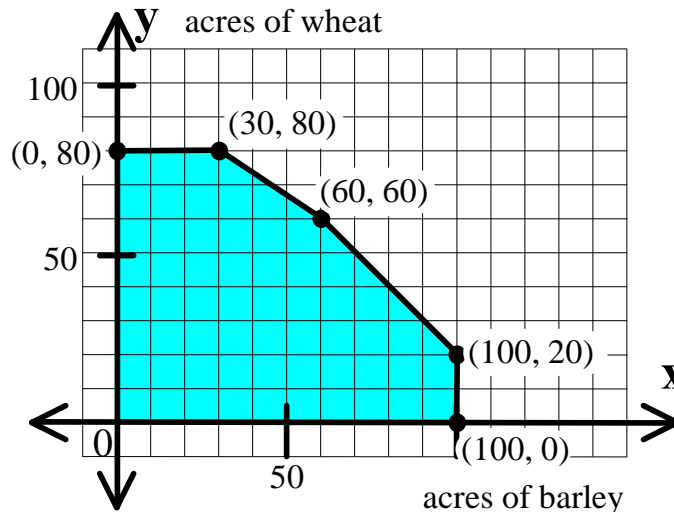
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	$20x$	$1000x$
wheat	y	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of T will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At (30,80)  $\Rightarrow T = 30,000 + 240,000$

$$T = 270,000$$

At (60,60)  $\Rightarrow T = 60,000 + 180,000$

$$T = 240,000$$

At (100,20)  $\Rightarrow T = 100,000 + 60,000$

## General Algebra II Unit 5 Introduction to Linear Programming

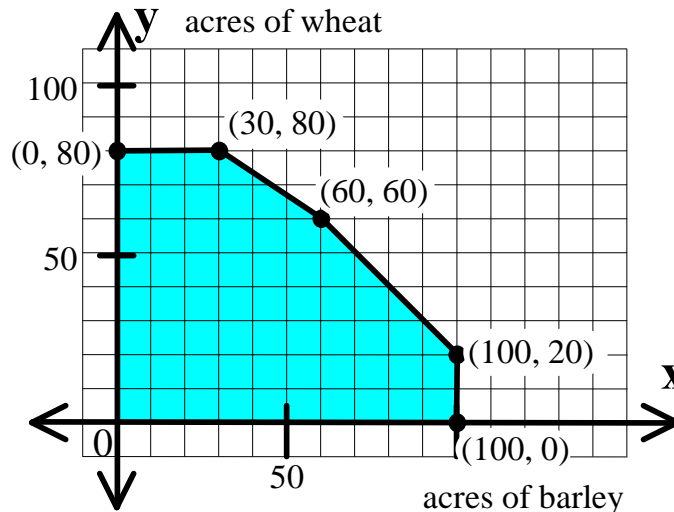
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At  $(30,80) \Rightarrow T = 30,000 + 240,000$

$$T = 270,000$$

At  $(60,60) \Rightarrow T = 60,000 + 180,000$

$$T = 240,000$$

At  $(100,20) \Rightarrow T = 100,000 + 60,000$

$$T = 160,000$$

## General Algebra II Unit 5 Introduction to Linear Programming

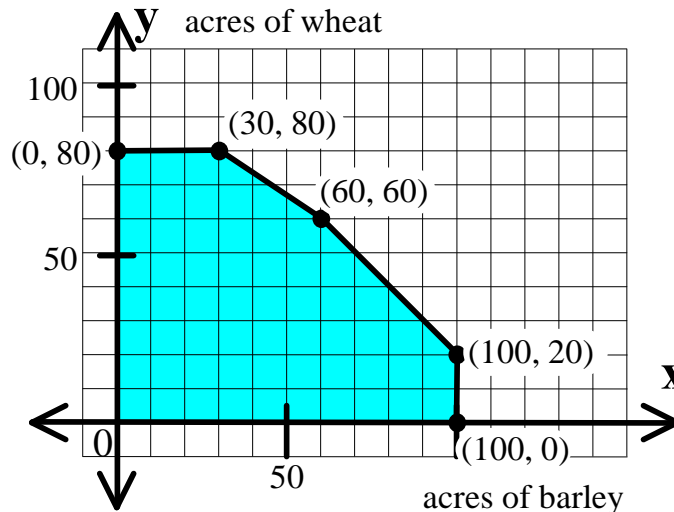
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	$x$	$20x$	$1000x$
wheat	$y$	$30y$	$3000y$

$$T = 1000x + 3000y$$

The **maximum** value of  $T$  will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At  $(30,80) \Rightarrow T = 30,000 + 240,000$

$T = 270,000$

At  $(60,60) \Rightarrow T = 60,000 + 180,000$

$T = 240,000$

At  $(100,20) \Rightarrow T = 100,000 + 60,000$

$T = 160,000$

## General Algebra II Unit 5 Introduction to Linear Programming

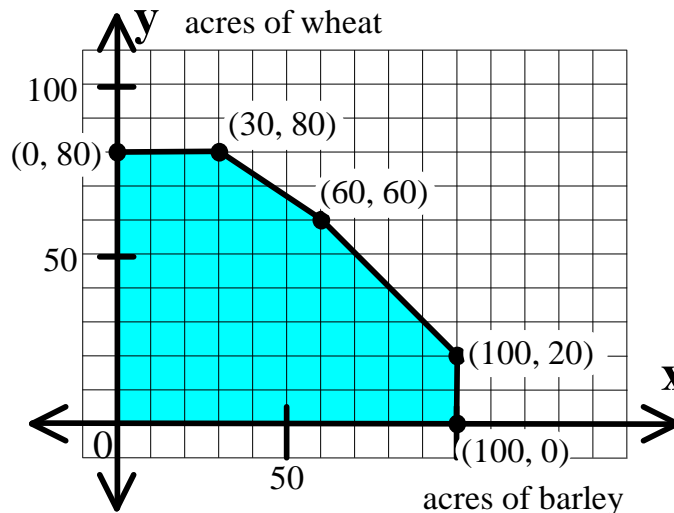
A farming family wishes to plant some barley and some wheat. They can plant a maximum of 100 acres of barley and a maximum of 80 acres of wheat. However, they only have 120 acres of land available for planting. Barley costs \$20 per acre for seeds, and wheat costs \$30 per acre for seeds. However, they only have \$3000 available for seed costs. They expect a harvest of 1000 pounds per acre of barley and 3000 pounds per acre of wheat. How many acres of each crop should they plant to maximize their total harvest?

	acres	seed cost	harvest
barley	x	20x	1000x
wheat	y	30y	3000y

$$T = 1000x + 3000y$$

The **maximum** value of T will occur at a vertex of the region.

$$\begin{aligned} x &\leq 100 \\ y &\leq 80 \\ x + y &\leq 120 \\ 20x + 30y &\leq 3000 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$



At (30,80)  $\Rightarrow T = 30,000 + 240,000$

$T = 270,000$

At (60,60)  $\Rightarrow T = 60,000 + 180,000$

$T = 240,000$

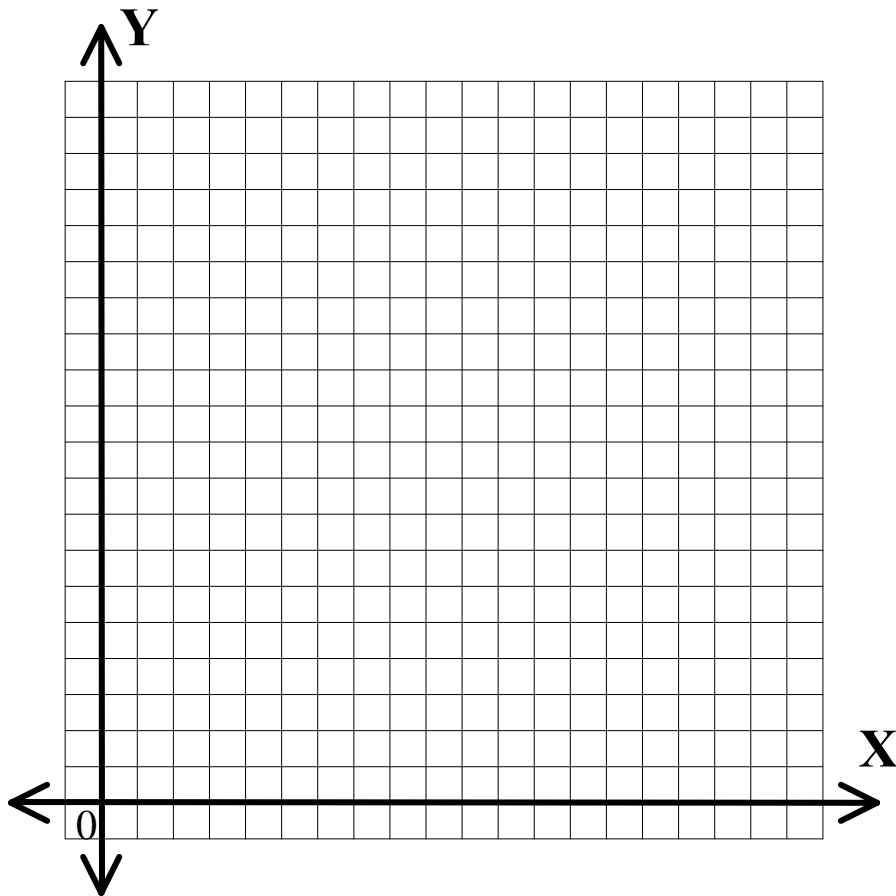
At (100,20)  $\Rightarrow T = 100,000 + 60,000$

$T = 160,000$

**They should plant 30 acres of barley and 80 acres of wheat.**

## General Algebra II CWS #2 Unit 5

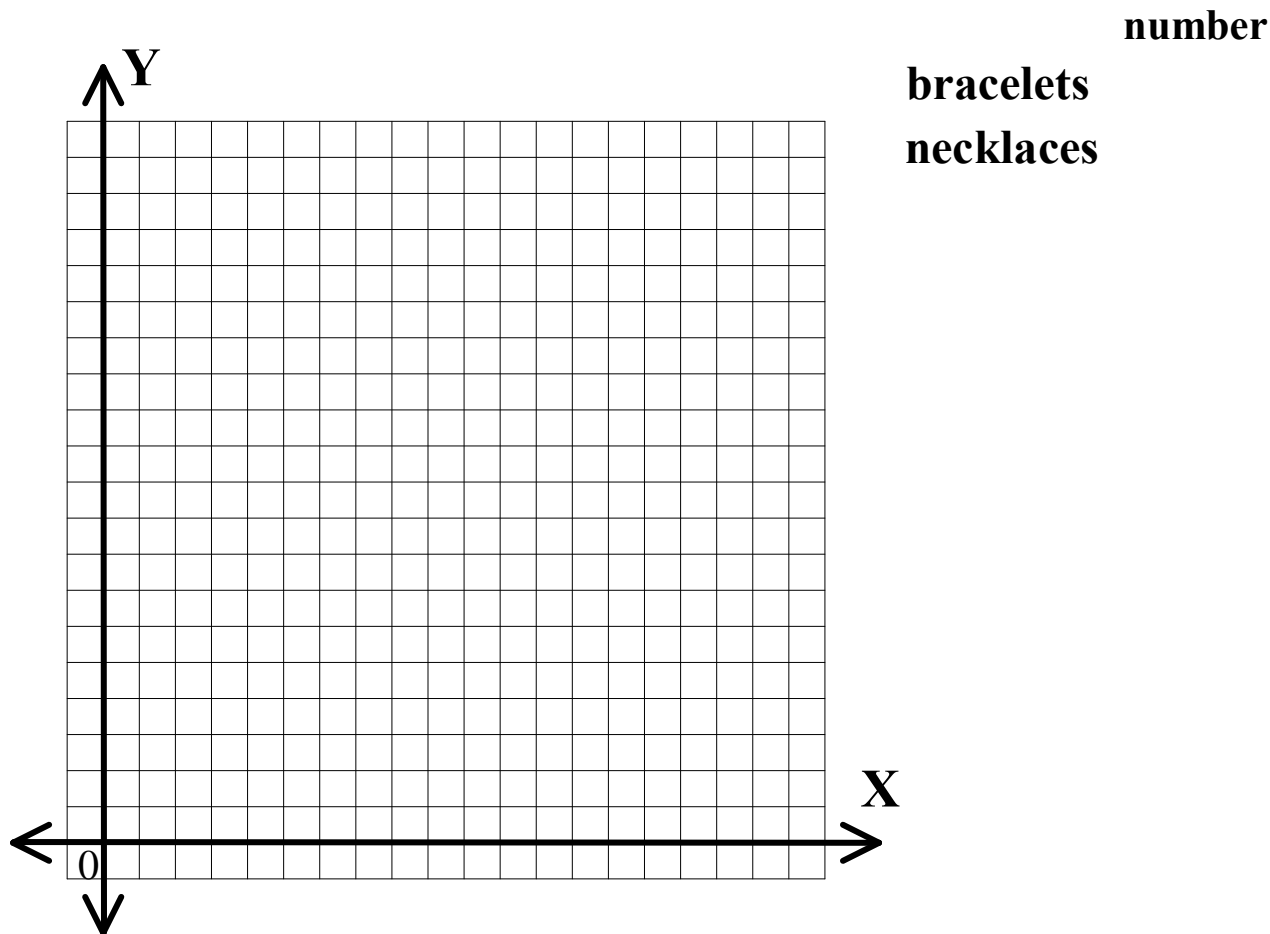
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.





## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



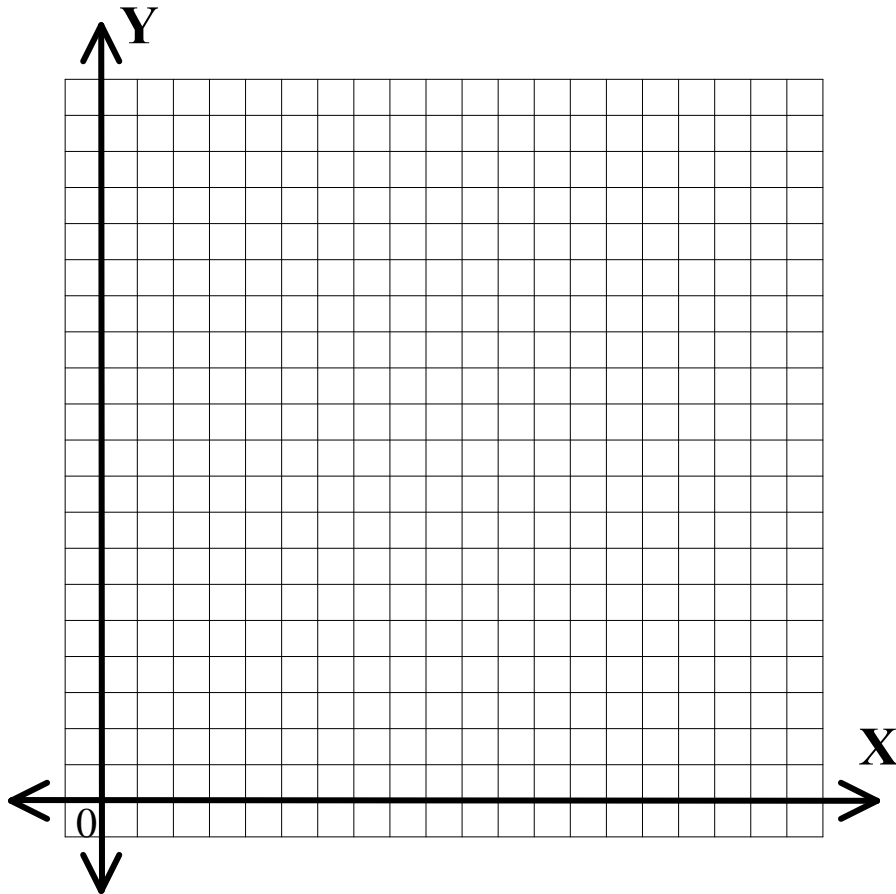
## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

**number**

**bracelets**     **x**

**necklaces**    **y**



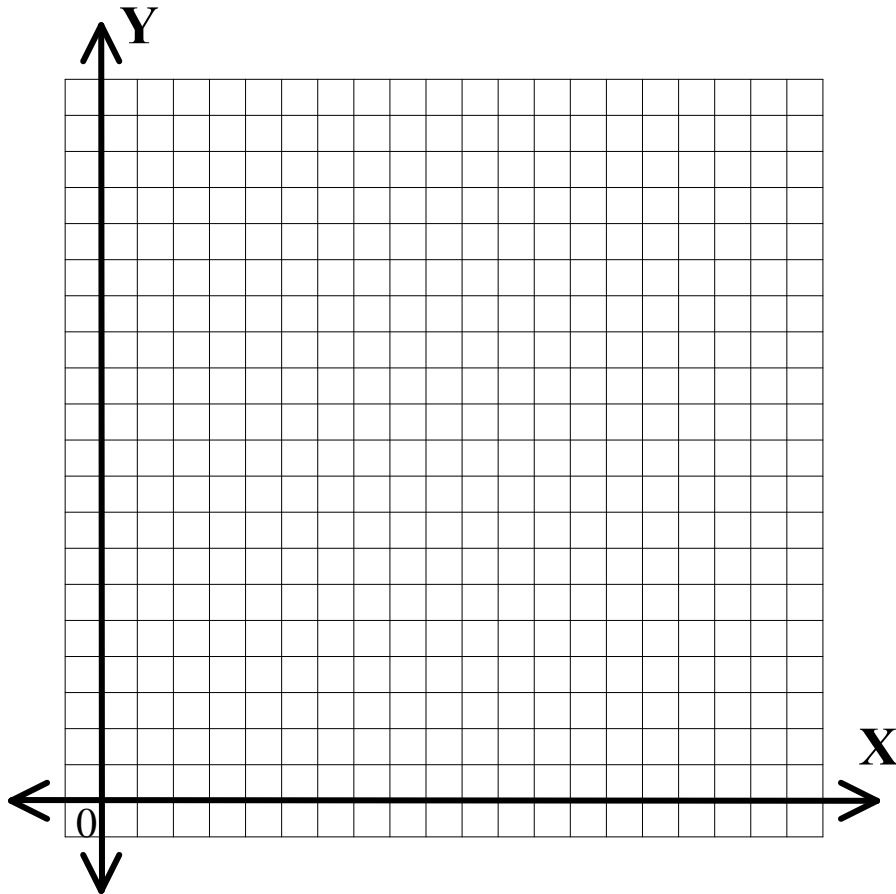
## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

number

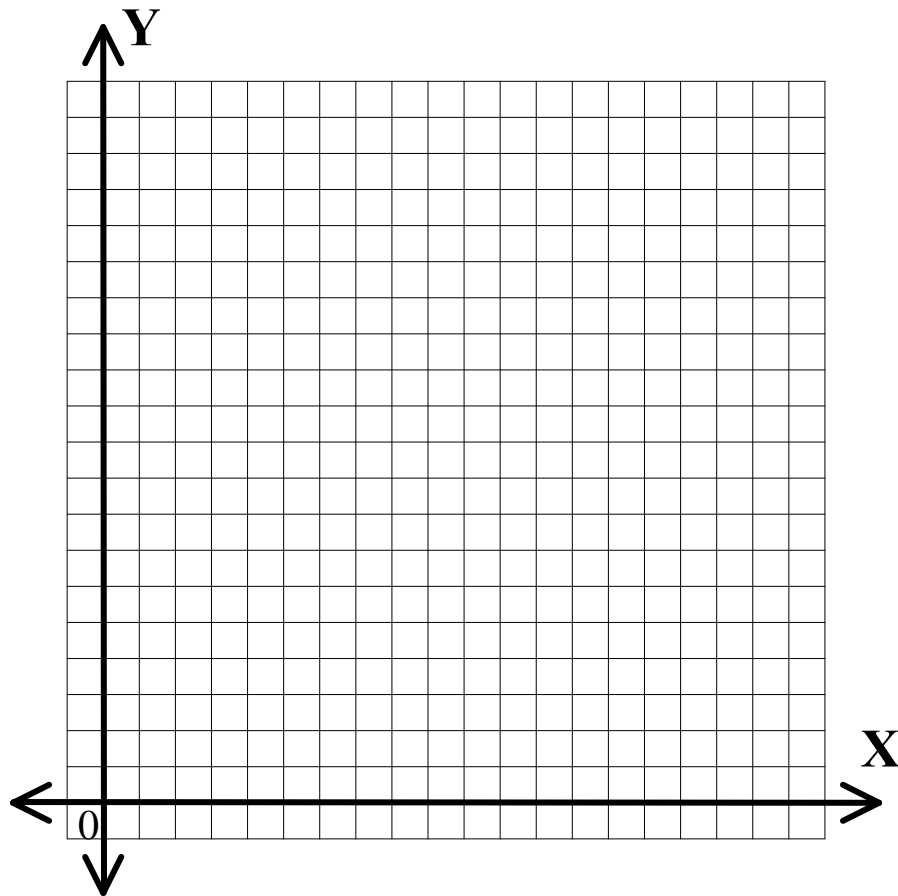
bracelets      $x$

necklaces     $y$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number
bracelets	$x$
necklaces	$y$
	$x + y$

## General Algebra II CWS #2 Unit 5

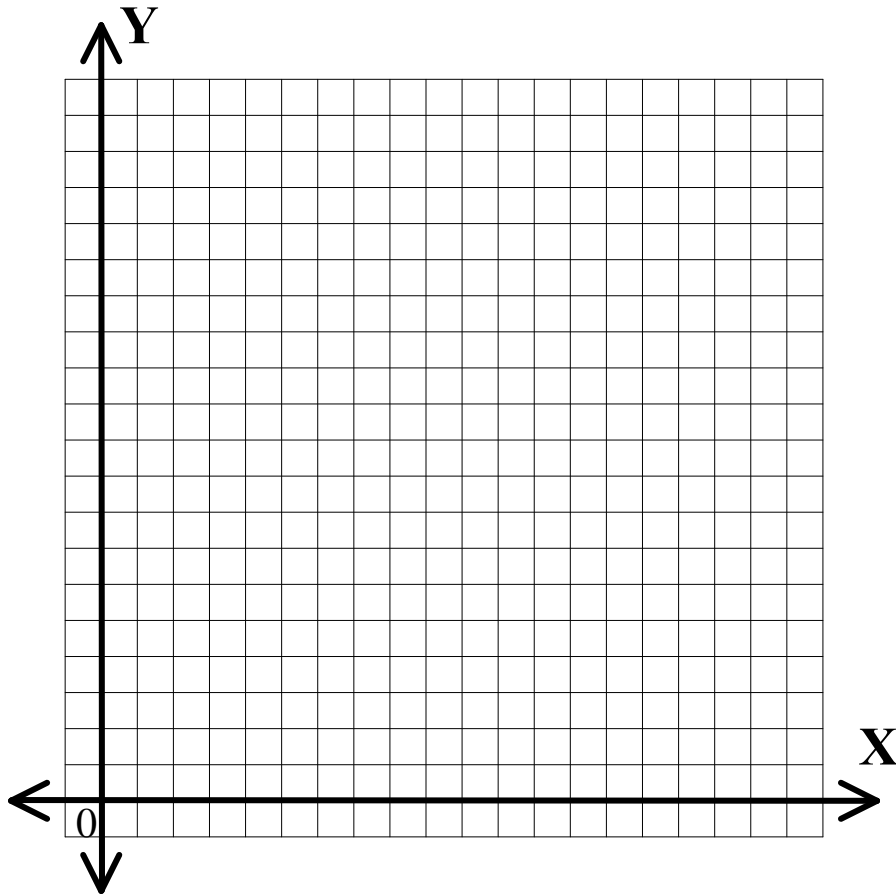
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

number

bracelets      $x$

necklaces     $y$

$$x + y \leq$$



## General Algebra II CWS #2 Unit 5

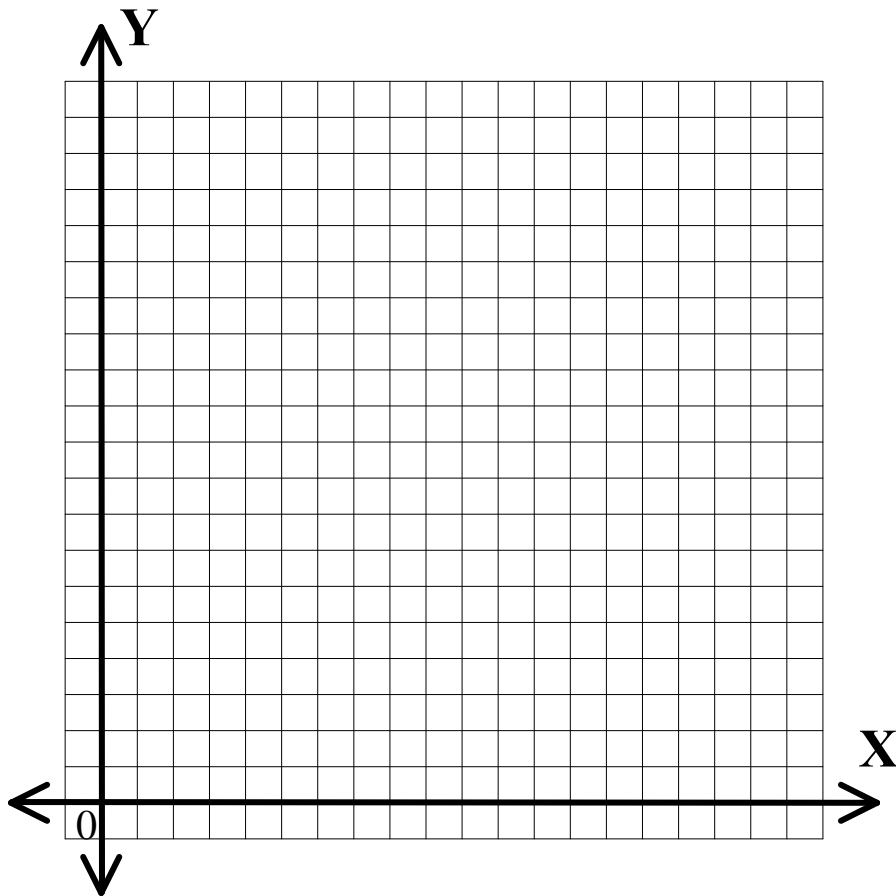
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

number

bracelets      $x$

necklaces     $y$

$$x + y \leq 24$$



## General Algebra II CWS #2 Unit 5

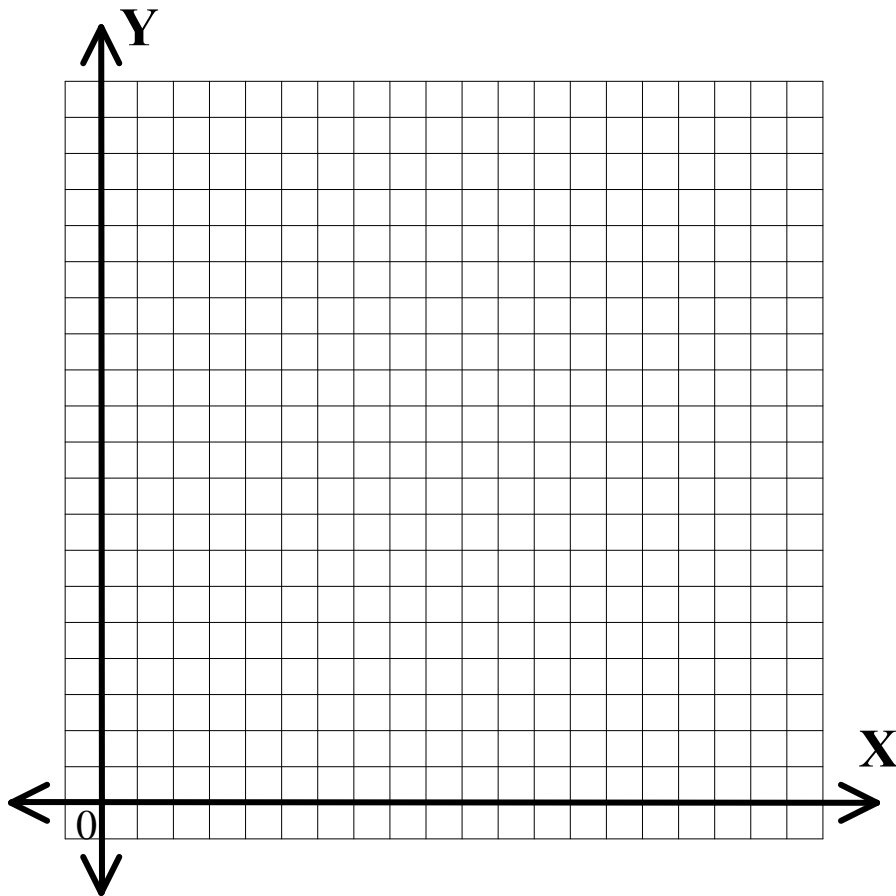
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

number

bracelets     **x**

necklaces    **y**

$$x + y \leq 24$$



## General Algebra II CWS #2 Unit 5

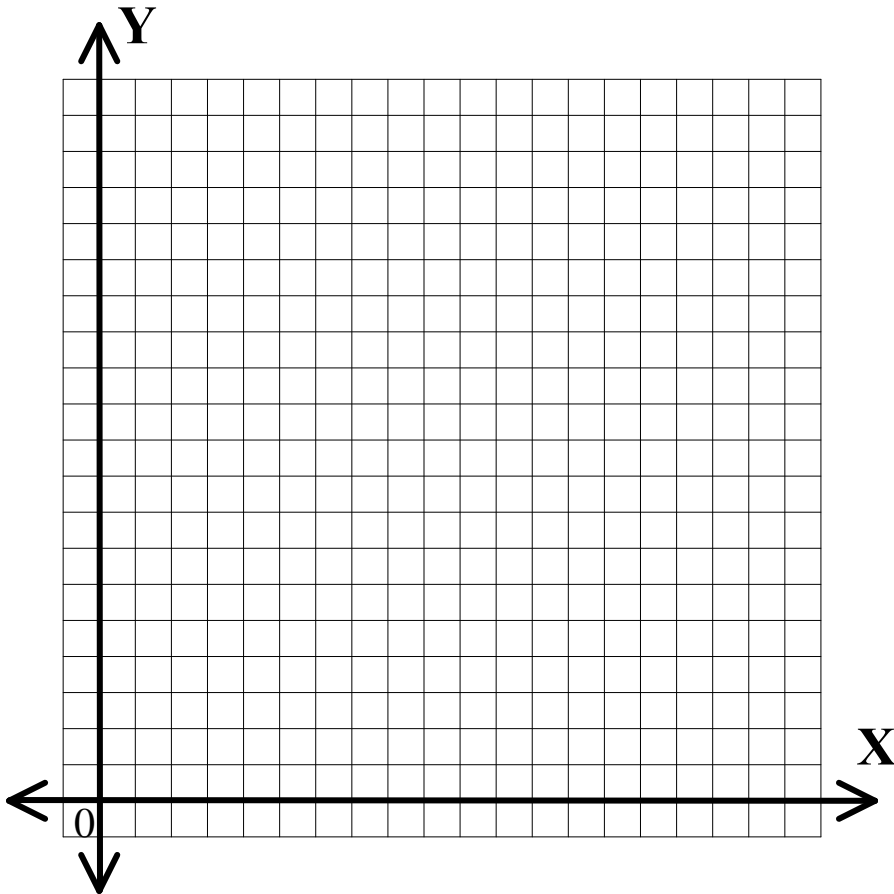
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

number

bracelets      $x$

necklaces     $y$

$$x + y \leq 24$$





## General Algebra II CWS #2 Unit 5

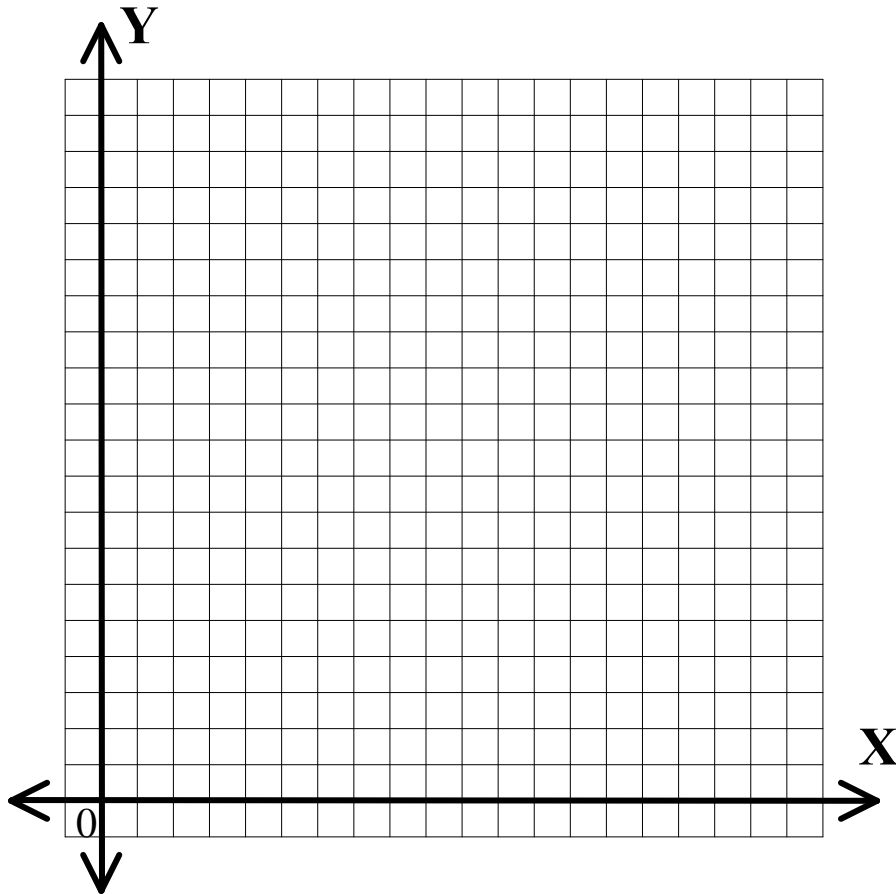
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

	number	labor (hours)
--	--------	---------------

bracelets	$x$	
-----------	-----	--

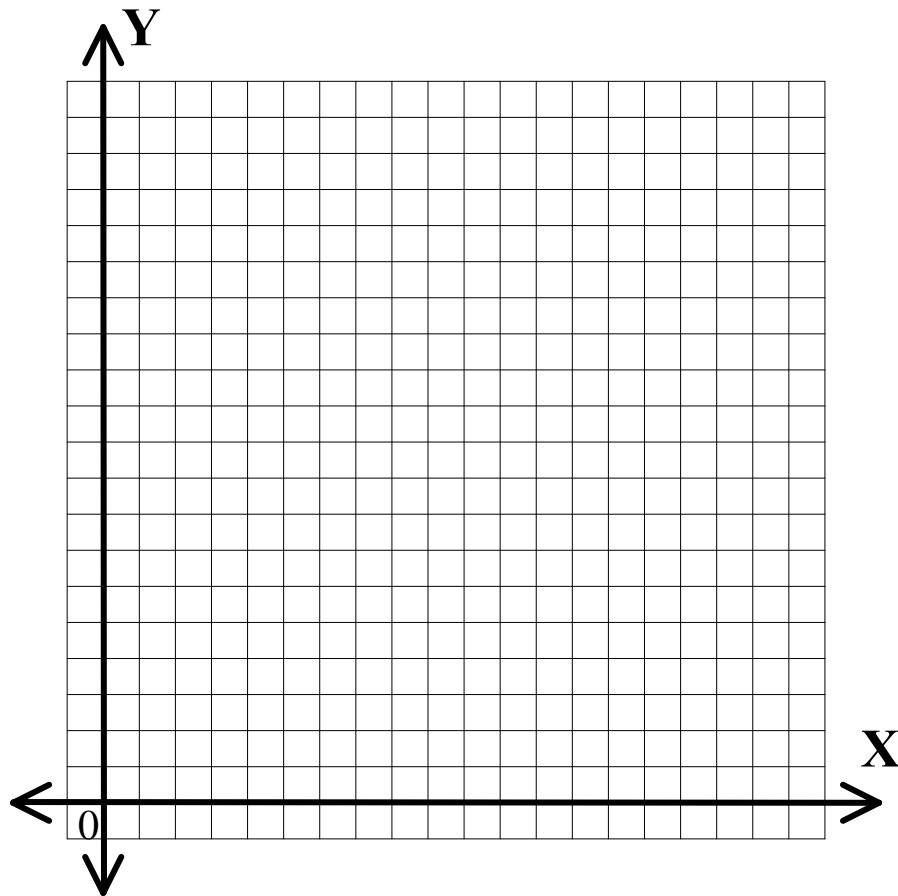
necklaces	$y$	
-----------	-----	--

$$x + y \leq 24$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	

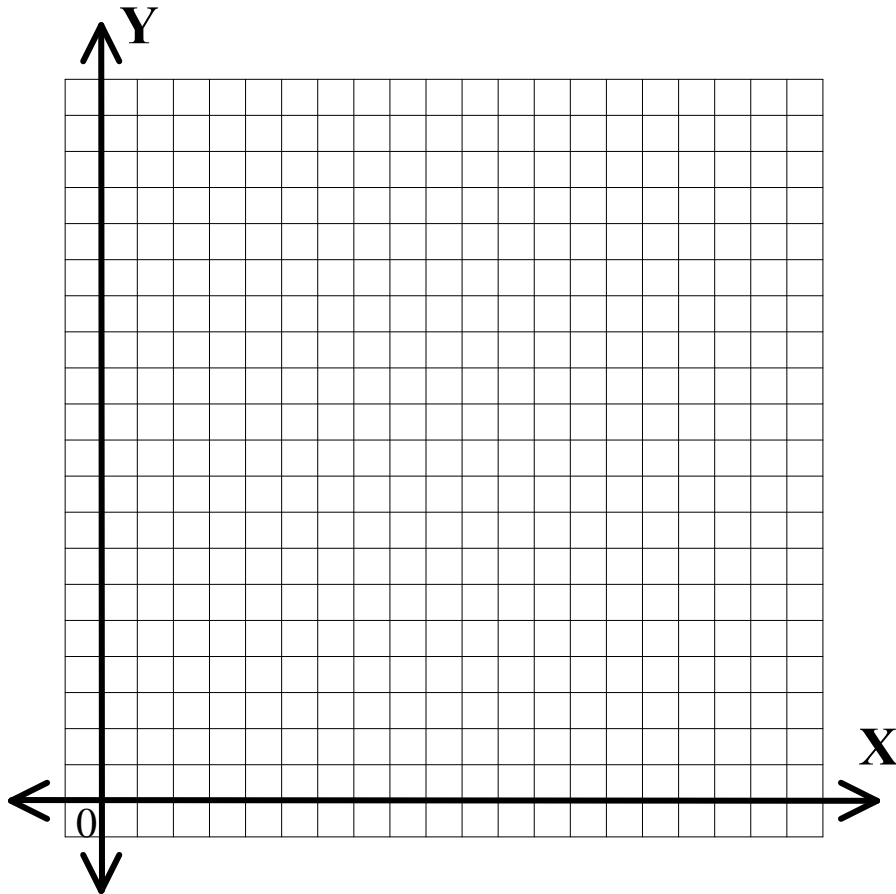
$$x + y \leq 24$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$

$$x + y \leq 24$$

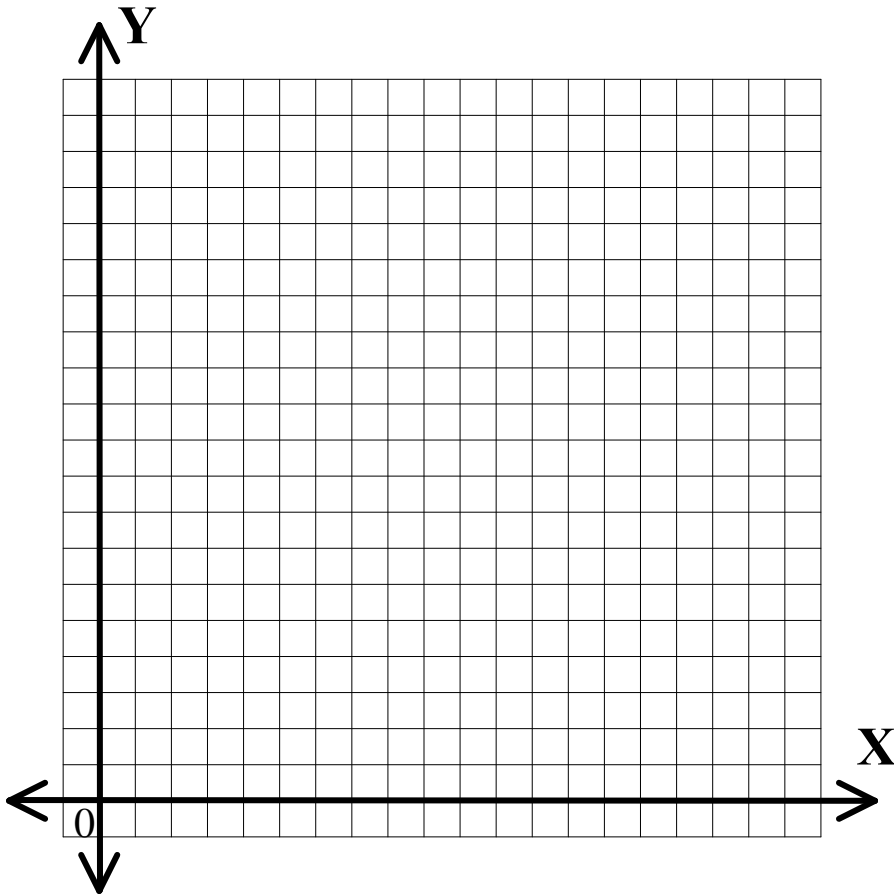


## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. **The total number of hours of labor available per day is 16.** The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

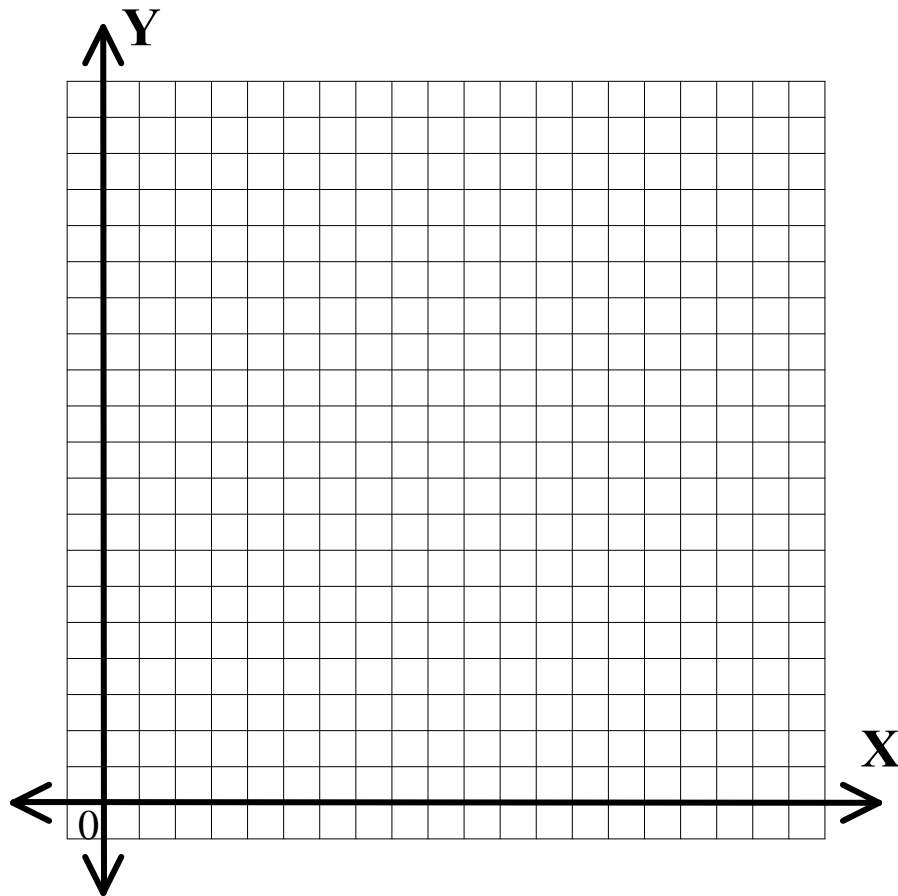
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$

$$x + y \leq 24$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. **The total number of hours of labor available per day is 16.** The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

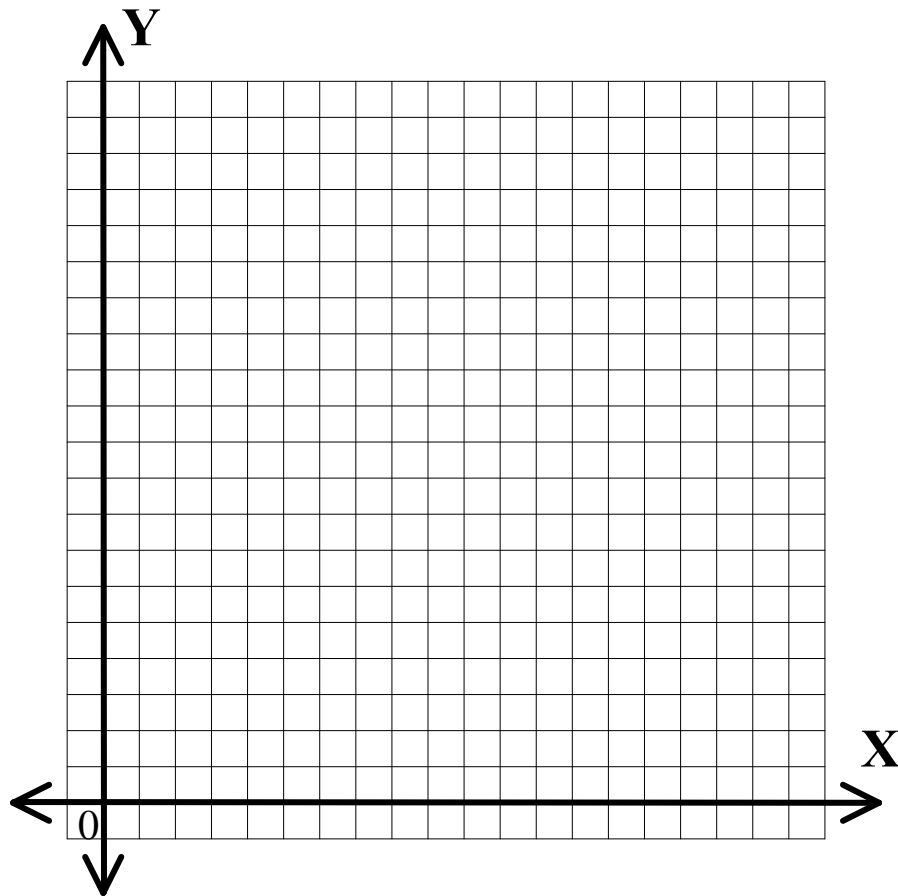


	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$x + y \leq 24$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. **The total number of hours of labor available per day is 16.** The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



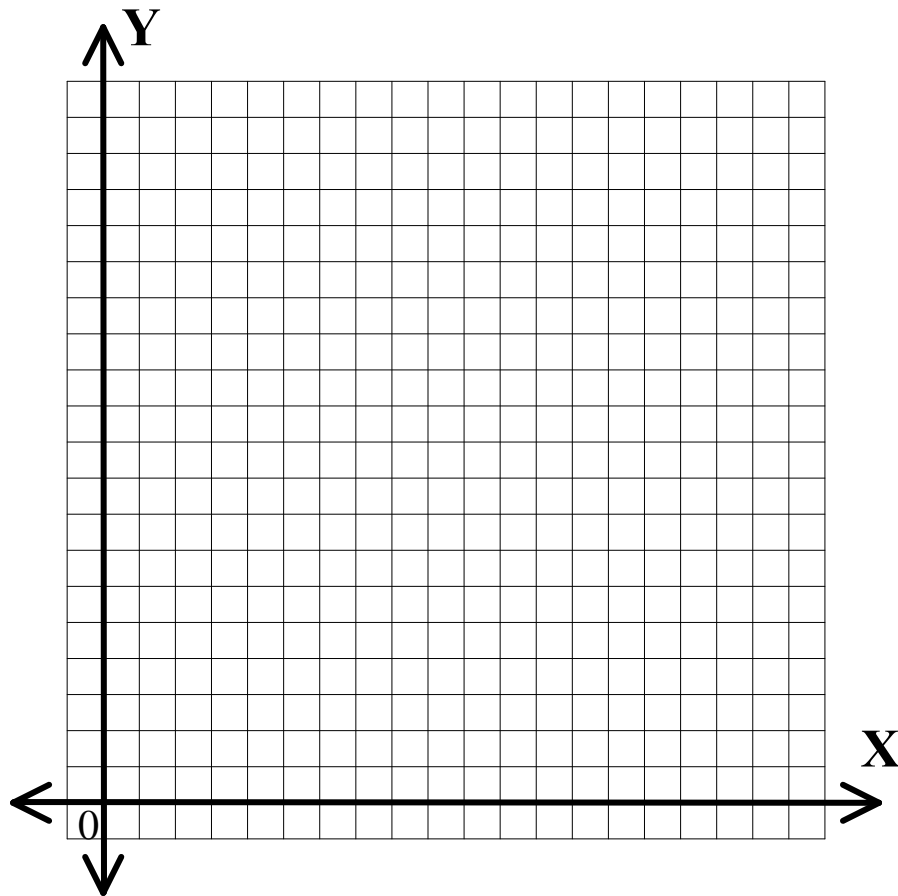
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$$x + y \leq 24$$

$$x + .5y$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. **The total number of hours of labor available per day is 16.** The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



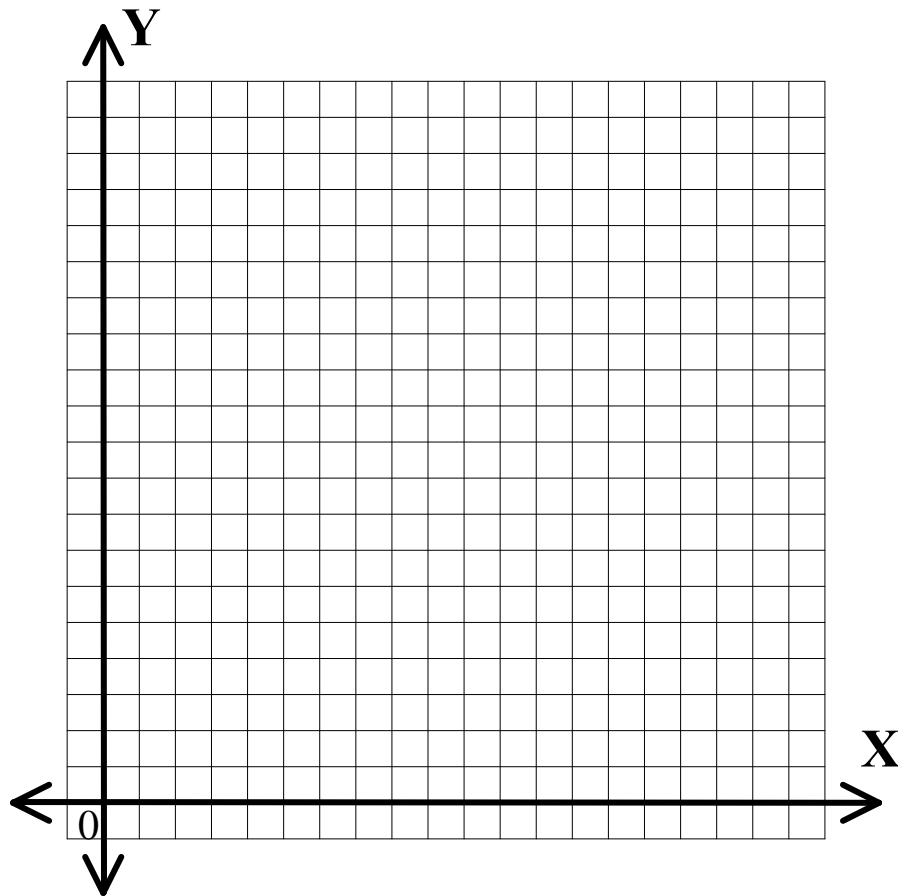
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$$x + y \leq 24$$

$$x + .5y \leq$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. **The total number of hours of labor available per day is 16.** The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

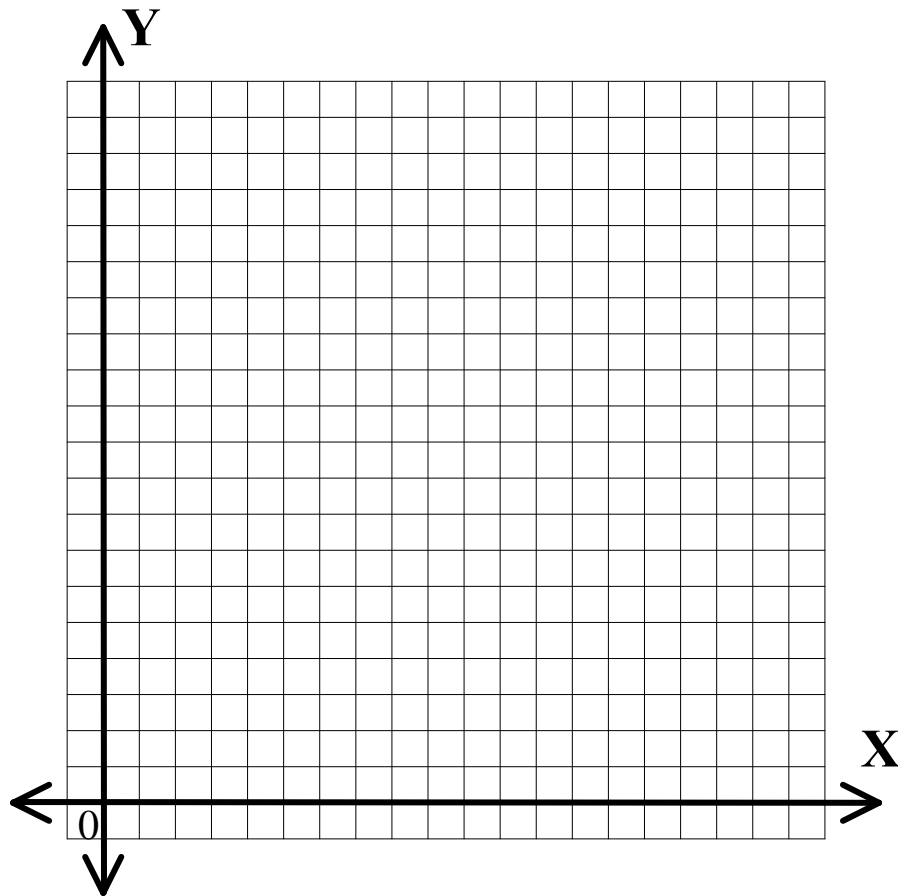
$$x + y \leq 24$$

$$x + .5y \leq 16$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$$x + y \leq 24$$

$$x + .5y \leq 16$$

## General Algebra II CWS #2 Unit 5

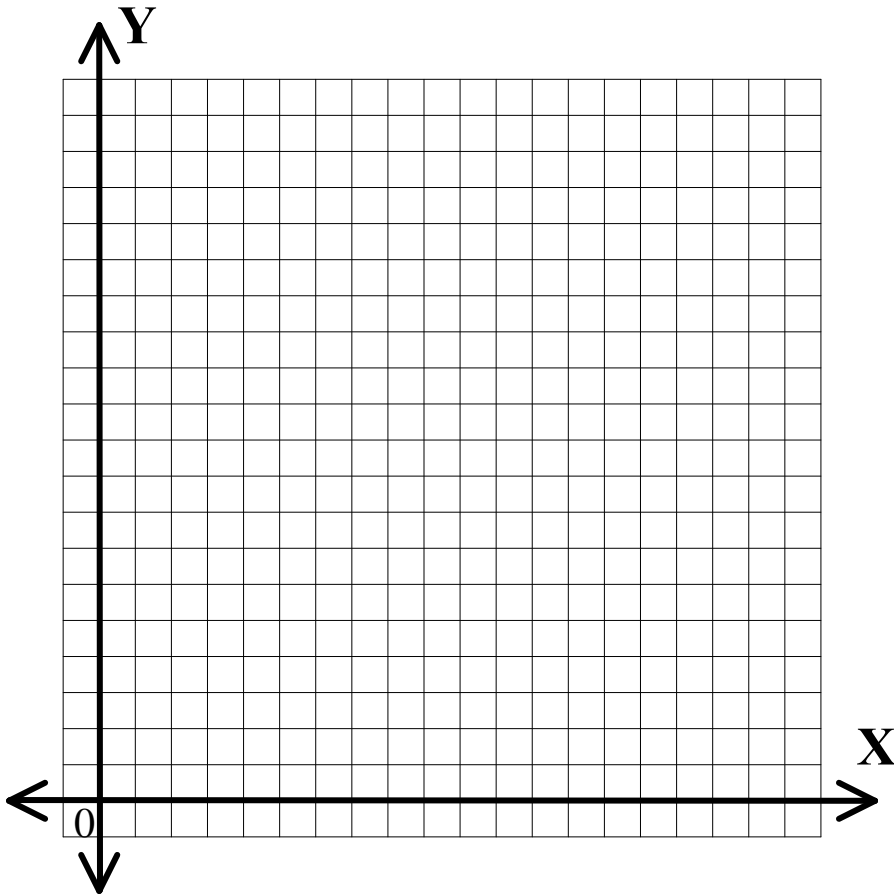
A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$$x + y \leq 24$$

$$x + .5y \leq 16$$

$$x \geq 0$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

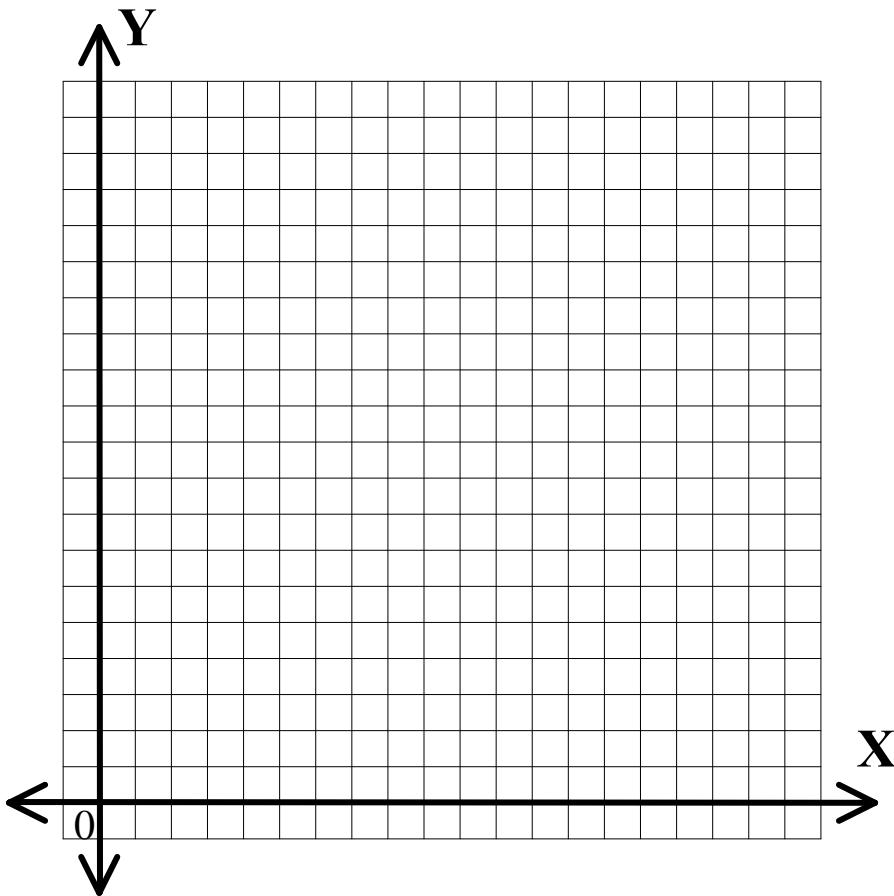
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		16

$$x + y \leq 24$$

$$x + .5y \leq 16$$

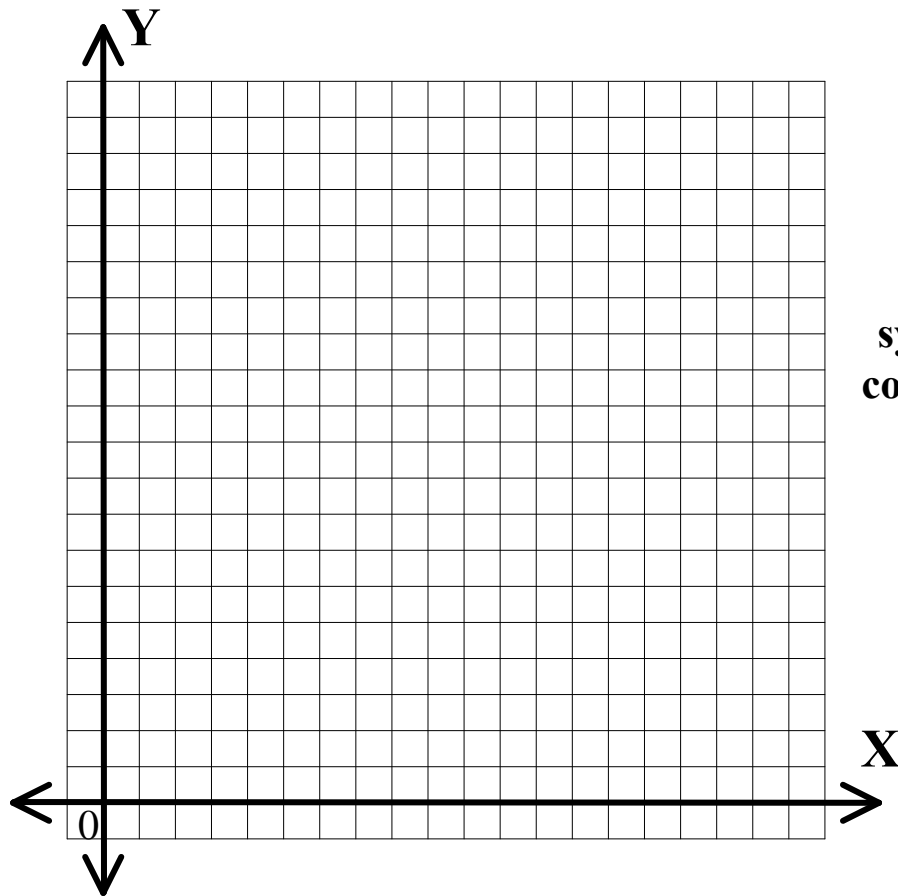
$$x \geq 0$$

$$y \geq 0$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



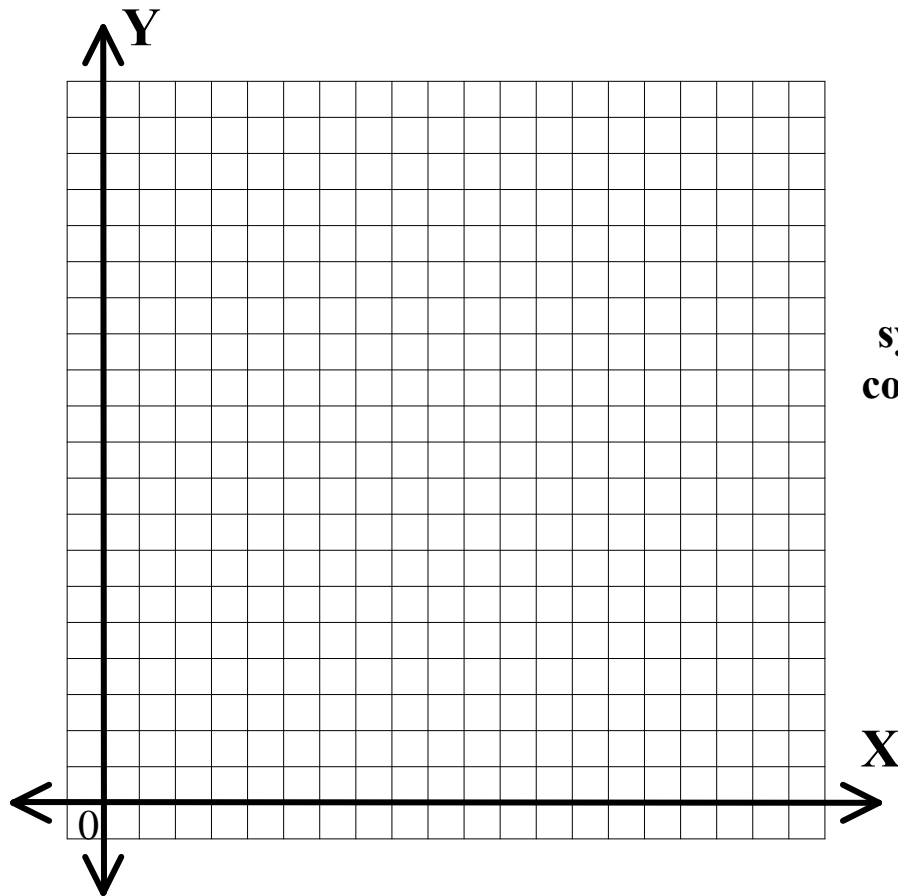
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		$16$

system of constraints

$$\begin{cases} x + y \leq 24 \\ x + .5y \leq 16 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



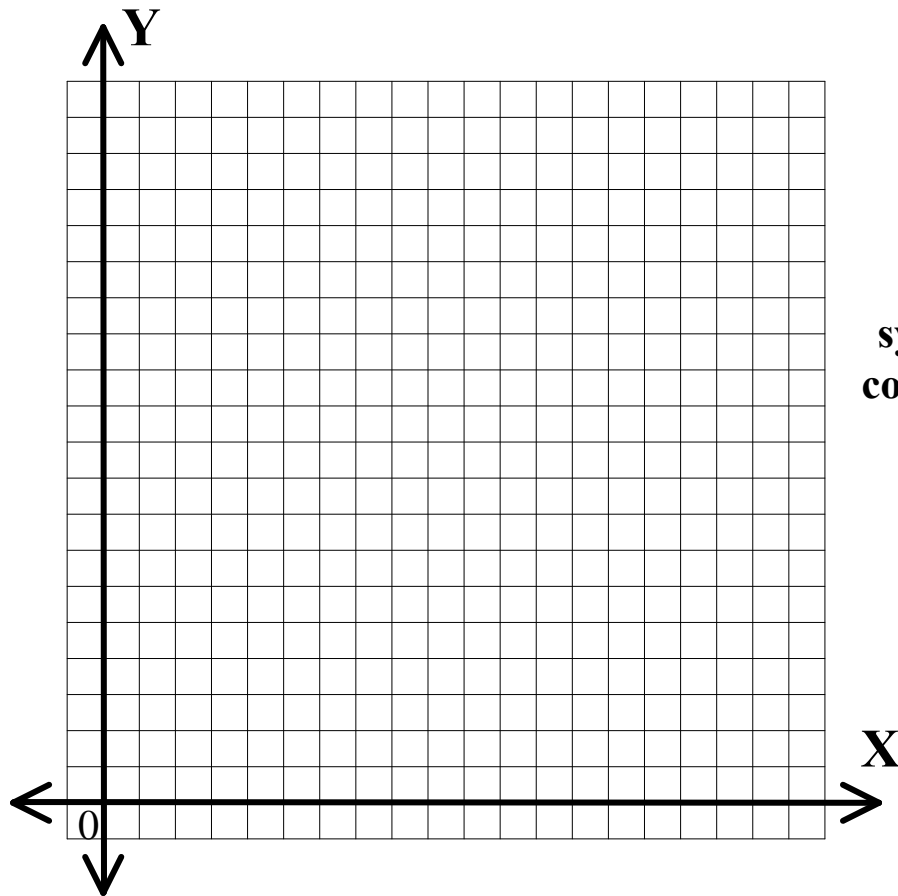
	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		$16$

system of constraints

$$\begin{cases} x + y \leq 24 \\ x + .5y \leq 16 \\ x \geq 0 \\ y \geq 0 \end{cases} \Rightarrow y \leq -x + 24$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

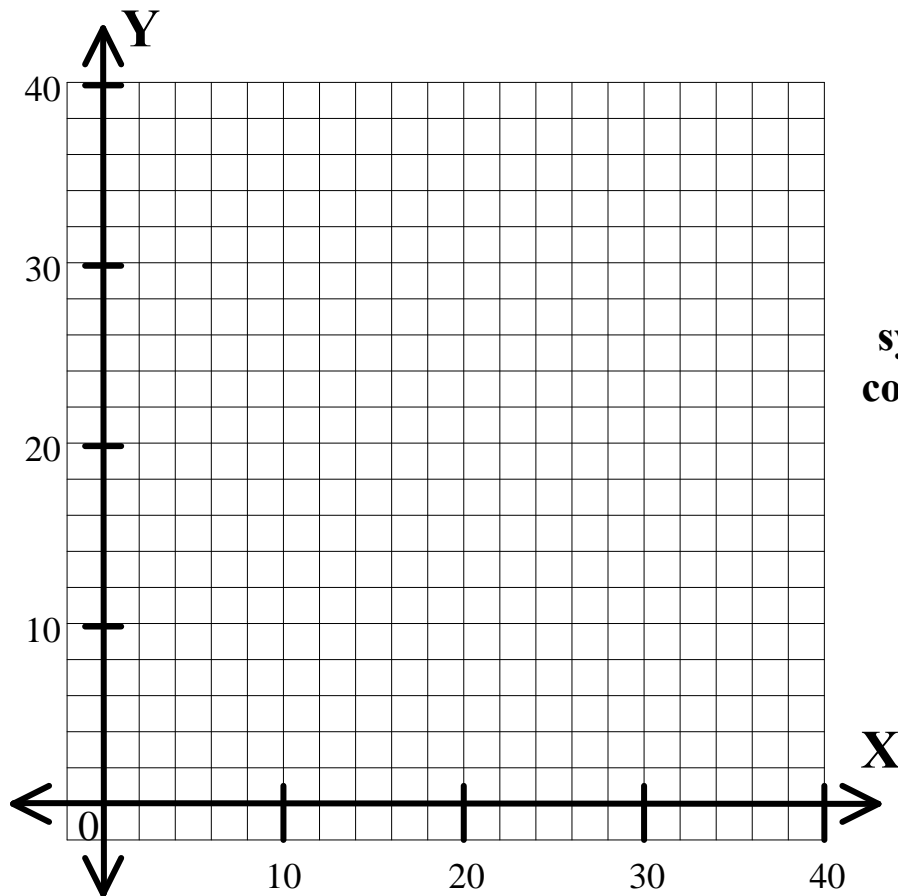


	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
	<b>available</b>	<b>16</b>

system of constraints	{	$x + y \leq 24$	$\Rightarrow$	$y \leq -x + 24$
		$x + .5y \leq 16$	$\Rightarrow$	$y \leq -2x + 32$
		$x \geq 0$		
		$y \geq 0$		

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

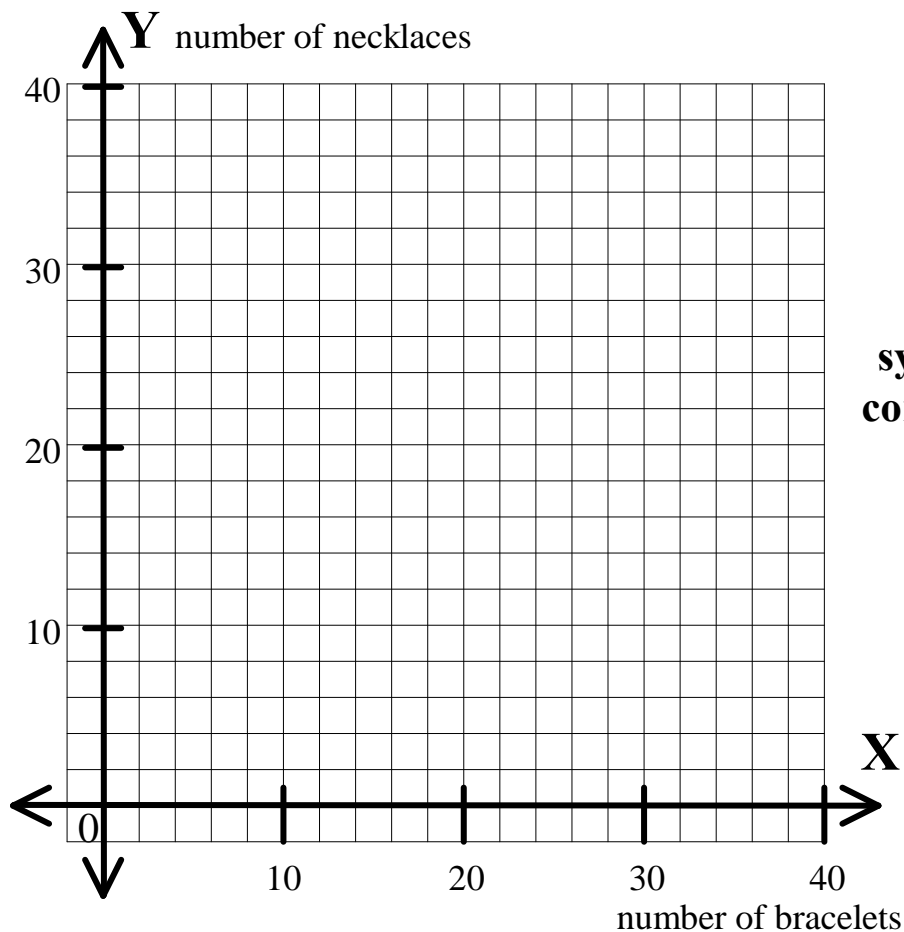


	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
	<b>available</b>	<b>16</b>

system of constraints	{	$x + y \leq 24$	$\Rightarrow$	$y \leq -x + 24$
		$x + .5y \leq 16$	$\Rightarrow$	$y \leq -2x + 32$
		$x \geq 0$		
		$y \geq 0$		

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
	<b>available</b>	<b>16</b>

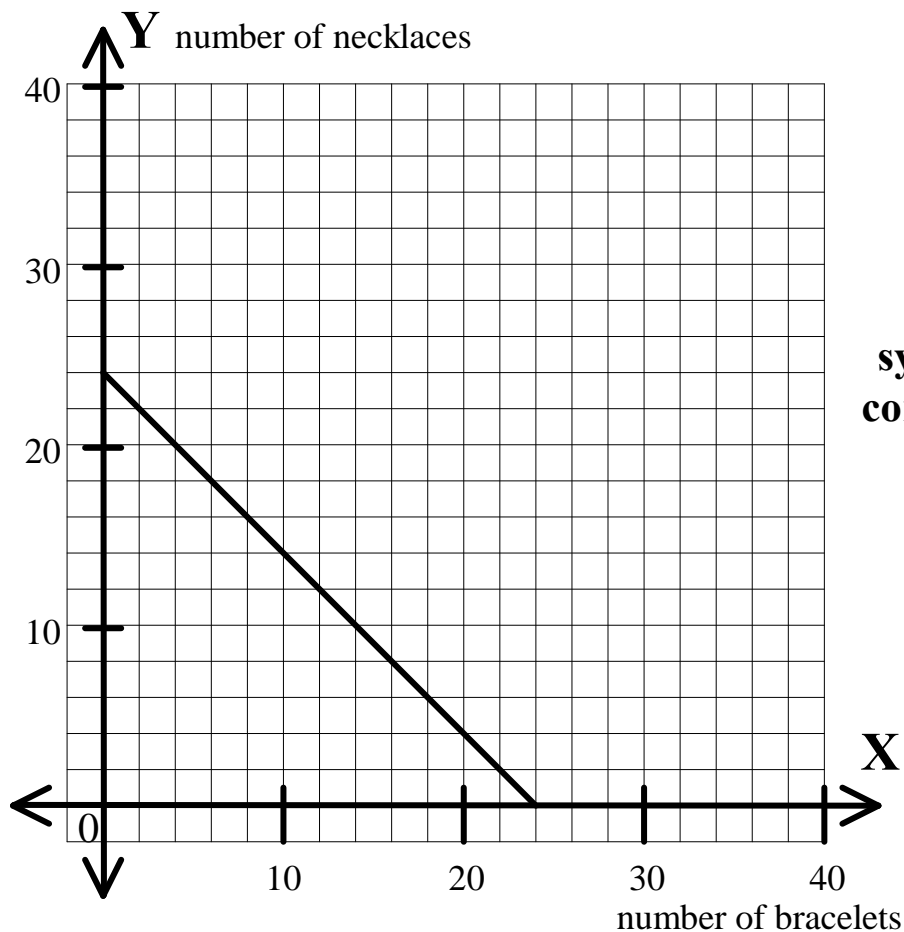
system of constraints

$$\left\{ \begin{array}{l} x + y \leq 24 \\ x + .5y \leq 16 \\ x \geq 0 \\ y \geq 0 \end{array} \right. \begin{array}{l} \Rightarrow y \leq -x + 24 \\ \Rightarrow y \leq -2x + 32 \end{array}$$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		$16$

system of constraints

{

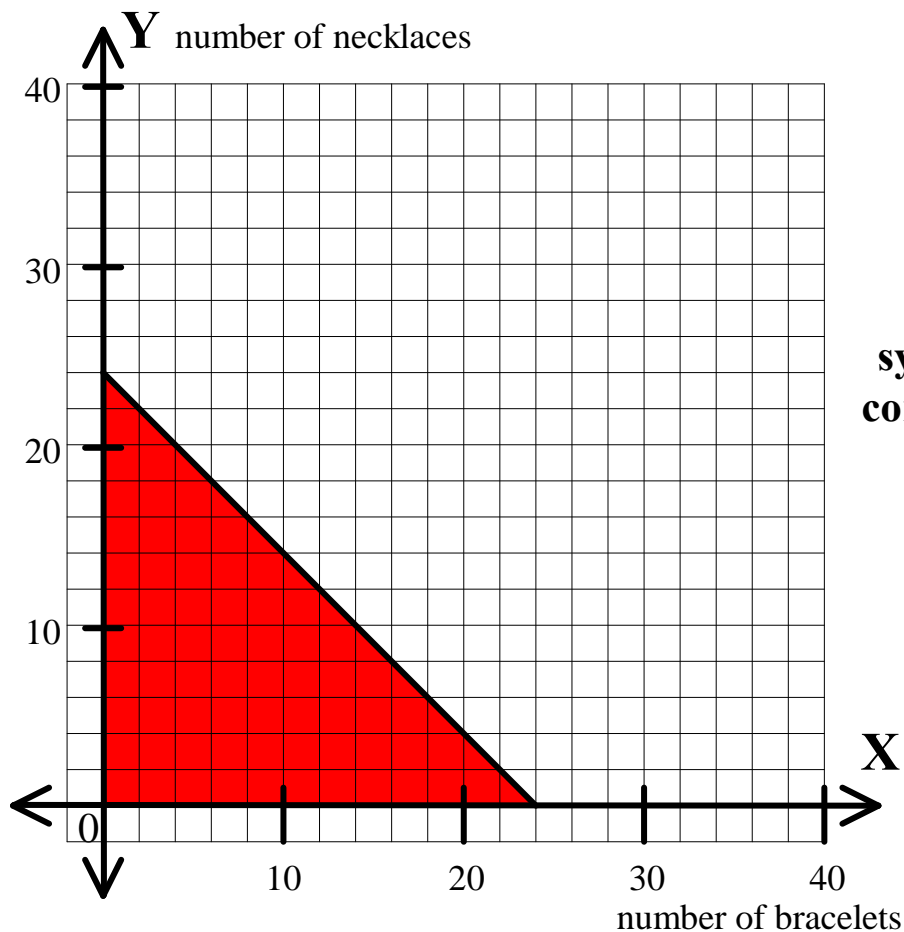
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
<b>bracelets</b>	<b>x</b>	<b>1x</b>
<b>necklaces</b>	<b>y</b>	<b>.5y</b>
<b>available</b>		<b>16</b>

system of constraints

{

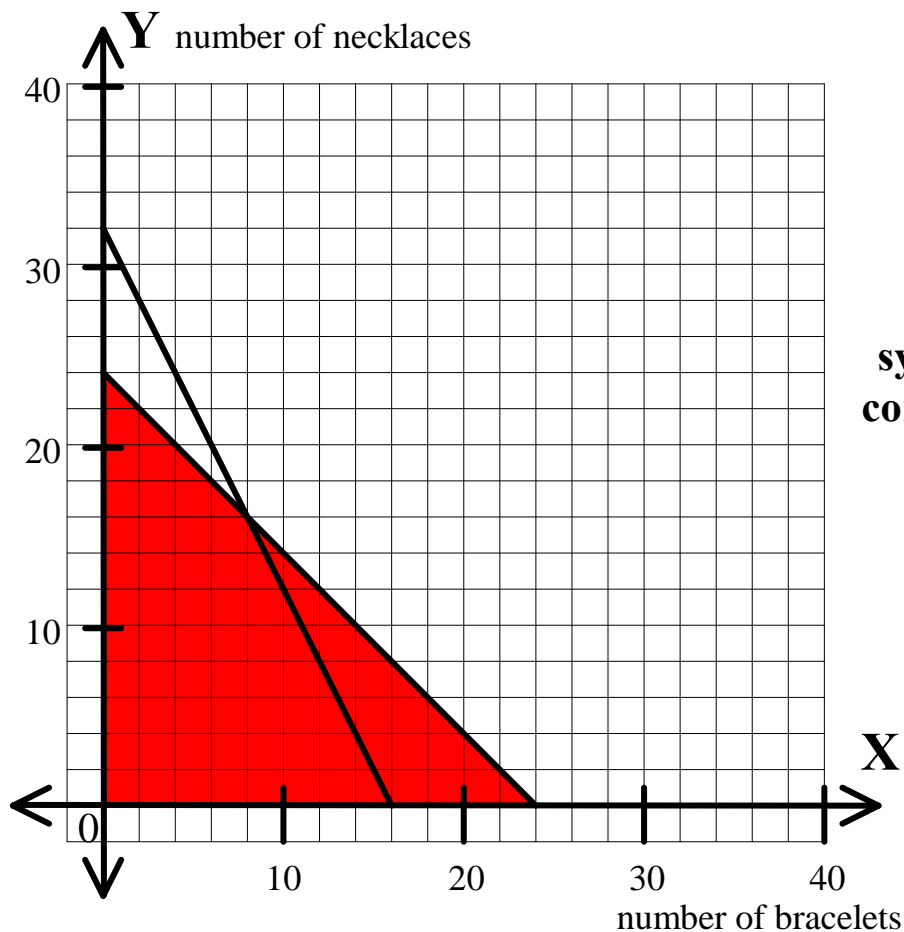
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
	<b>available</b>	<b>16</b>

system of constraints

{

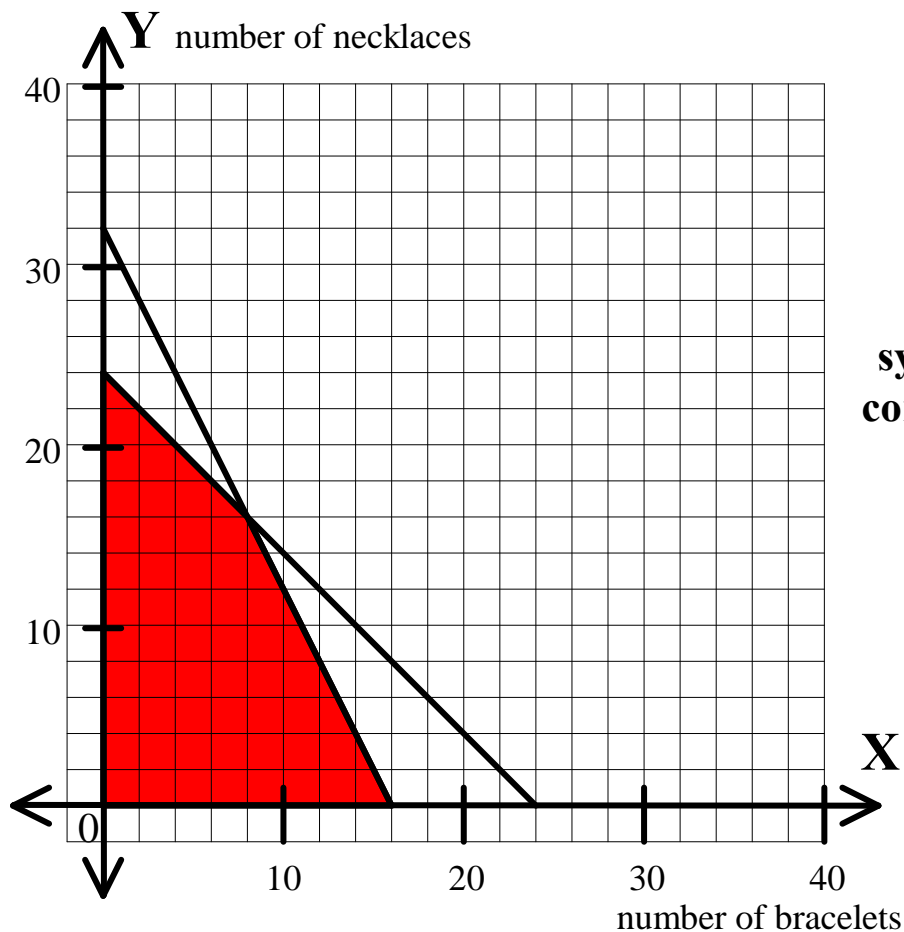
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		<b>16</b>

system of constraints

{

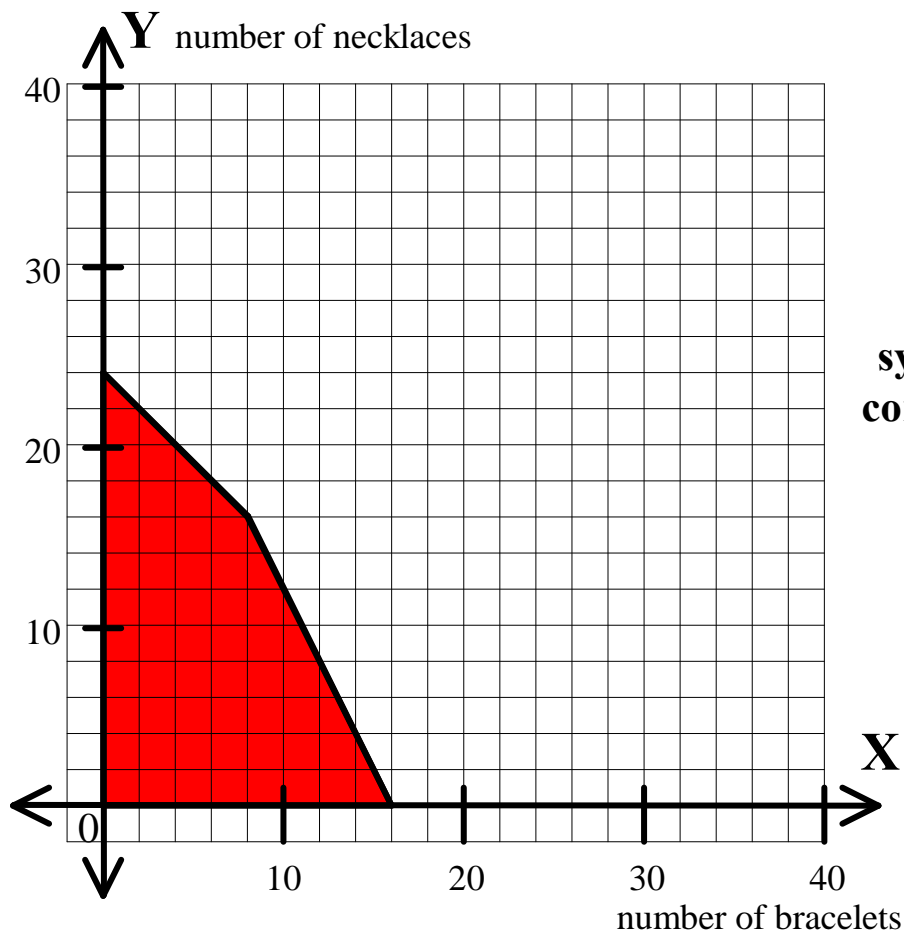
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		$16$

system of constraints

{

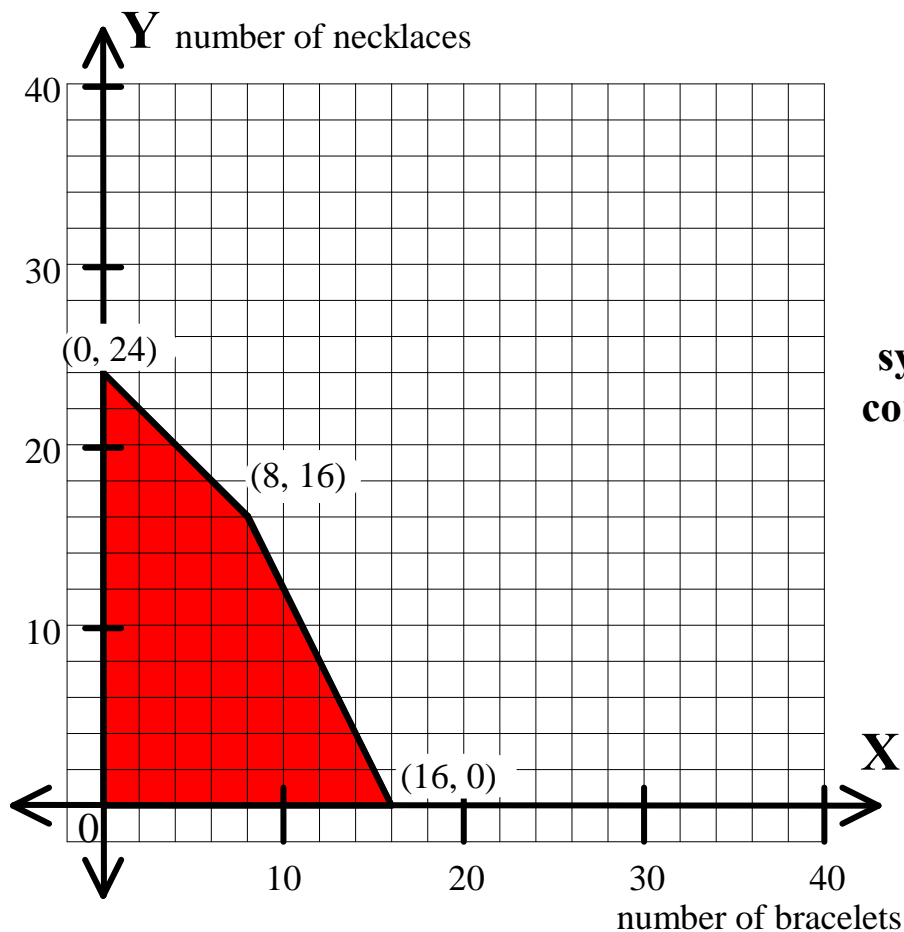
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
<b>bracelets</b>	<b>x</b>	<b>1x</b>
<b>necklaces</b>	<b>y</b>	<b>.5y</b>
<b>available</b>		<b>16</b>

system of constraints

{

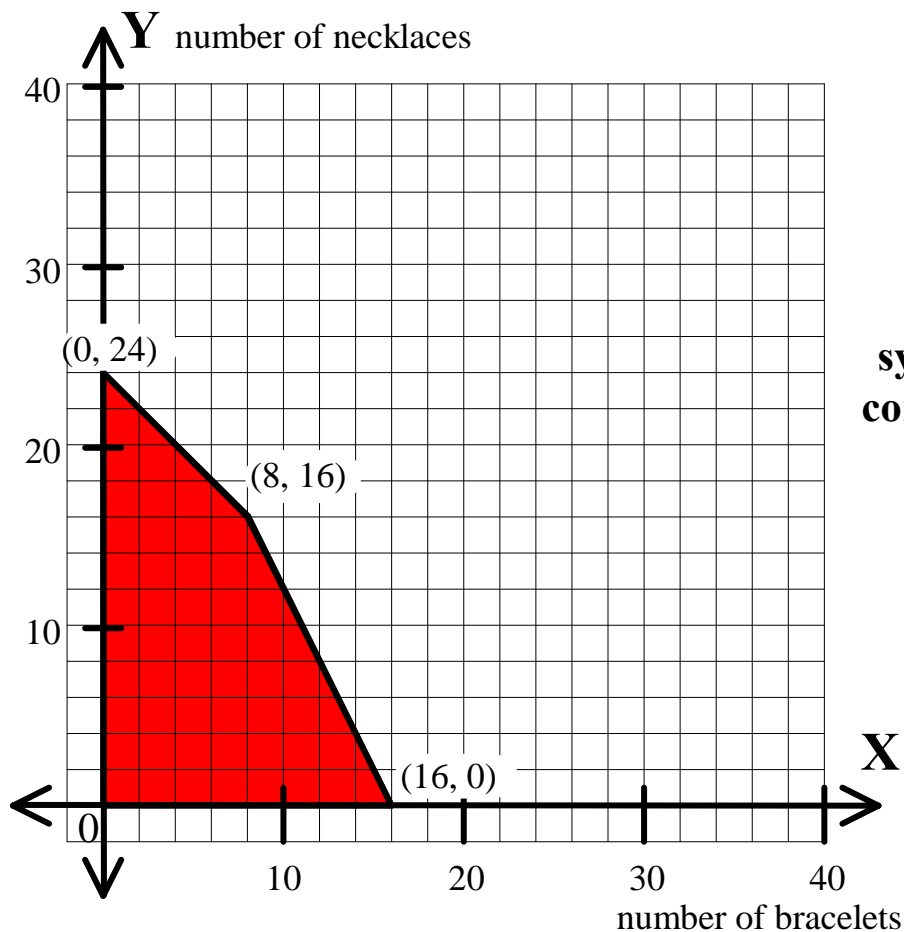
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. **The profit on each bracelet is \$4, and the profit on each necklace is \$3.** How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)
bracelets	$x$	$1x$
necklaces	$y$	$.5y$
available		<b>16</b>

system of constraints

{

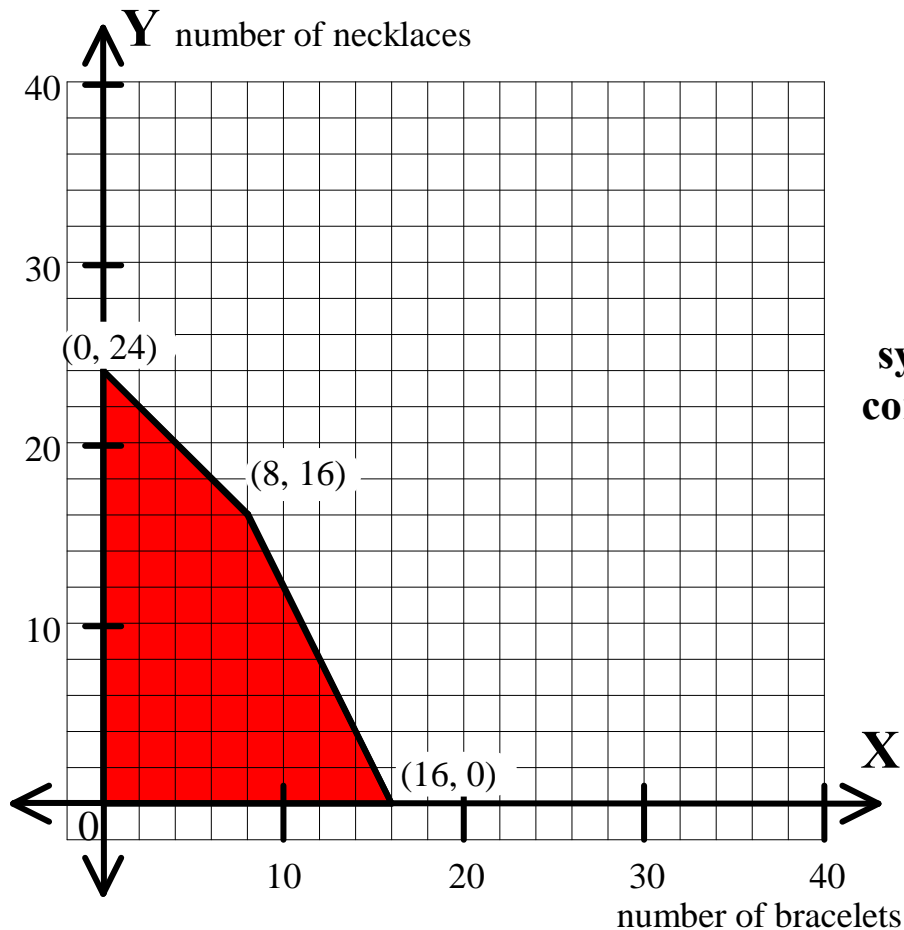
$x + y \leq 24$   
 $x + .5y \leq 16$   
 $x \geq 0$   
 $y \geq 0$

$\Rightarrow$   
 $\Rightarrow$

$y \leq -x + 24$   
 $y \leq -2x + 32$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. **The profit on each bracelet is \$4, and the profit on each necklace is \$3.** How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



	number	labor (hours)	profit (dollars)
bracelets	$x$	$1x$	
necklaces	$y$	$.5y$	
	<b>available</b>	<b>16</b>	

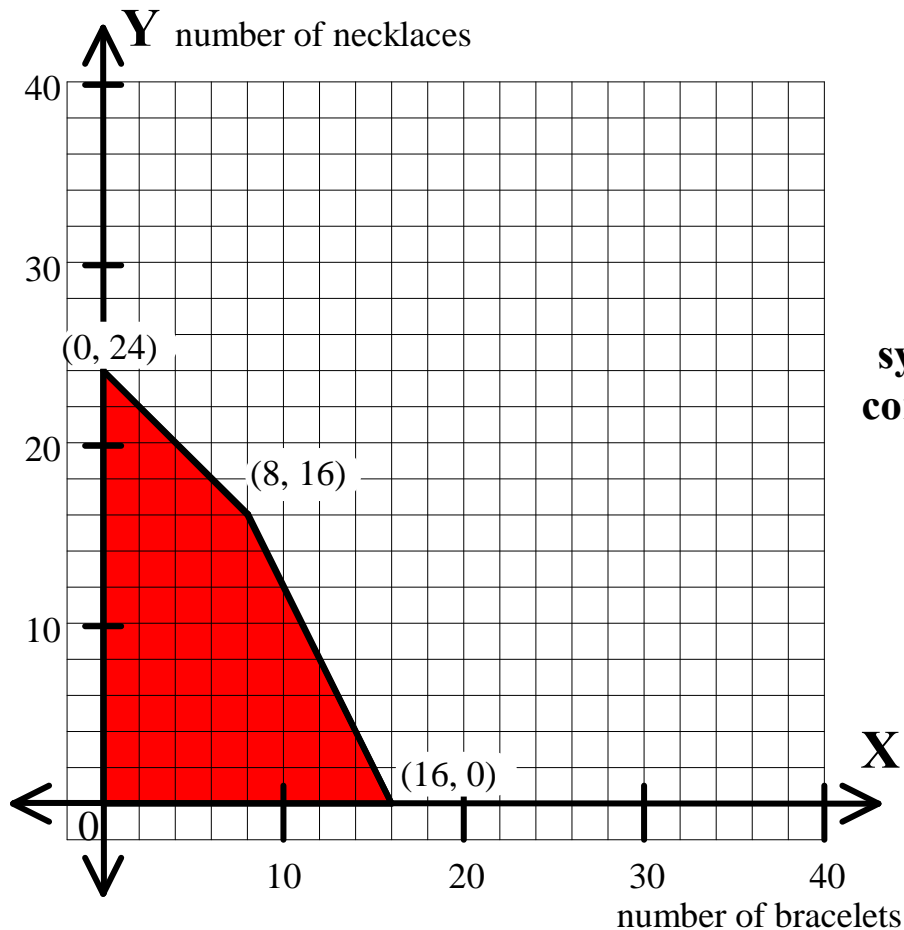
  

system of constraints	{	$x + y \leq 24$	$\Rightarrow$	$y \leq -x + 24$
		$x + .5y \leq 16$	$\Rightarrow$	$y \leq -2x + 32$
		$x \geq 0$		
		$y \geq 0$		



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. **The profit on each bracelet is \$4, and the profit on each necklace is \$3.** How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



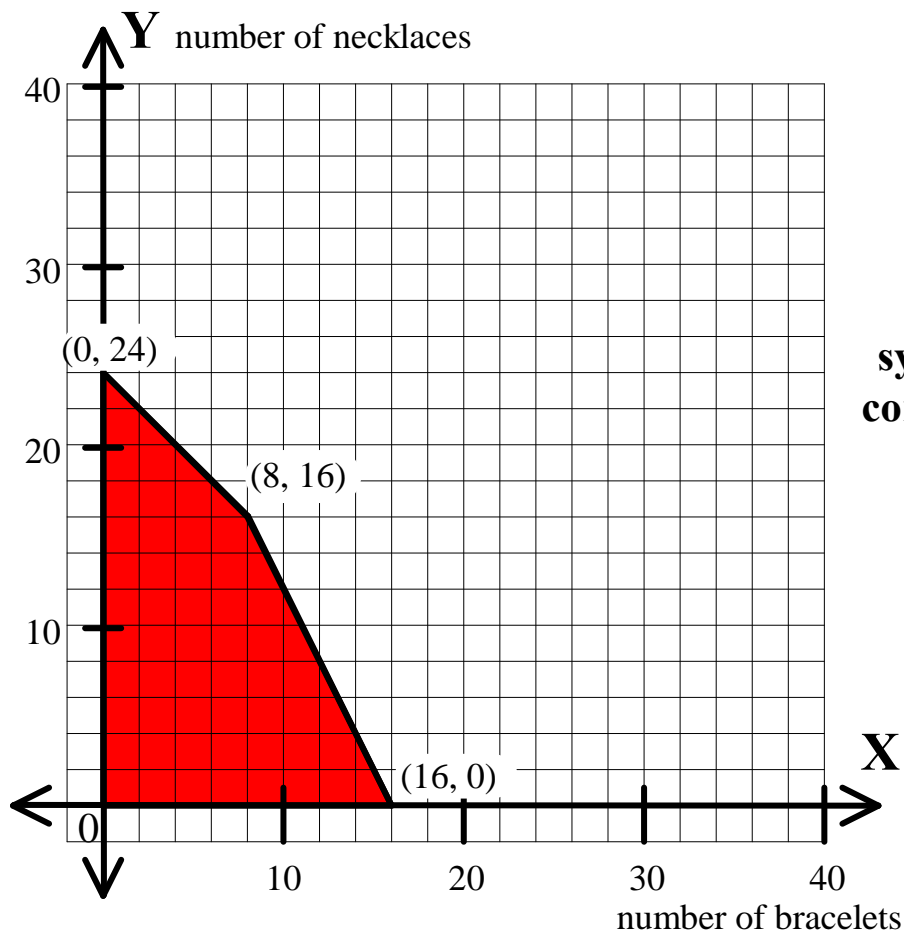
	number	labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	
available		<b>16</b>	

system of constraints	{	$x + y \leq 24$	$\Rightarrow$	$y \leq -x + 24$
		$x + .5y \leq 16$	$\Rightarrow$	$y \leq -2x + 32$
		$x \geq 0$		
		$y \geq 0$		

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. **The profit on each bracelet is \$4, and the profit on each necklace is \$3.** How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



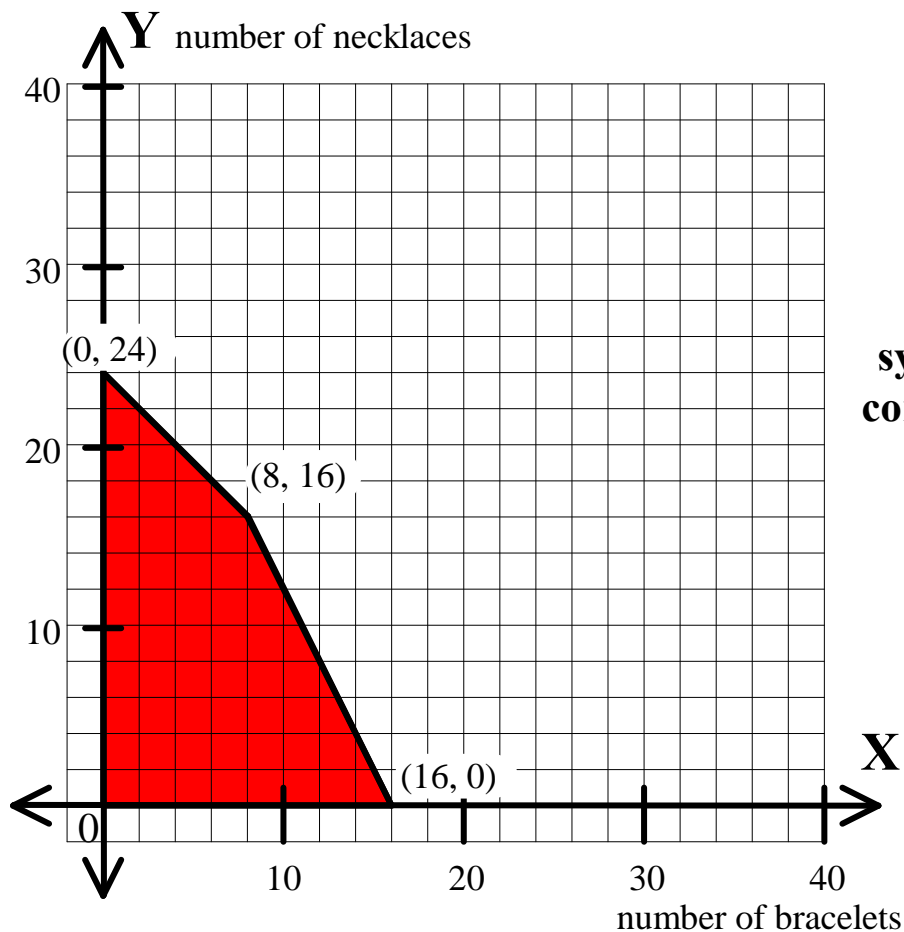
	number	labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	<b>available</b>	<b>16</b>	

system of constraints

$$\left\{ \begin{array}{l} x + y \leq 24 \quad \Rightarrow \quad y \leq -x + 24 \\ x + .5y \leq 16 \quad \Rightarrow \quad y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{array} \right.$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



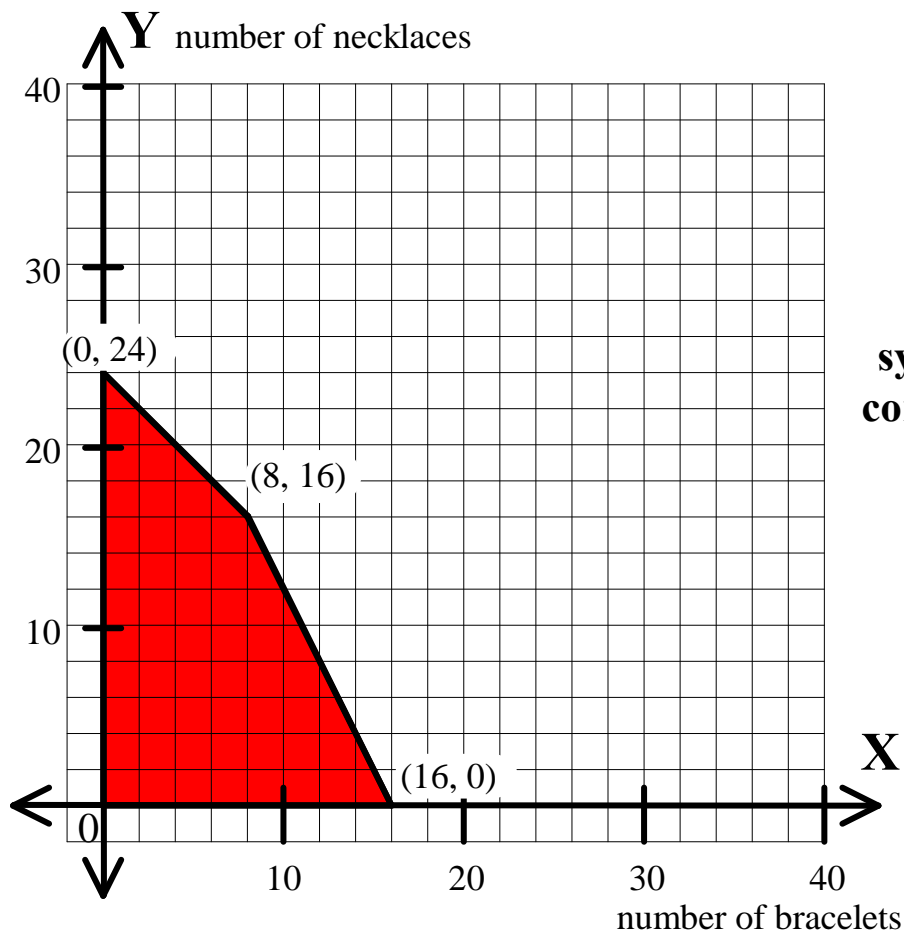
	number	labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	<b>available</b>	<b>16</b>	

system of constraints

$$\left\{ \begin{array}{l} x + y \leq 24 \quad \Rightarrow \quad y \leq -x + 24 \\ x + .5y \leq 16 \quad \Rightarrow \quad y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{array} \right.$$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	<b>x</b>	<b>1x</b>	<b>4x</b>
necklaces	<b>y</b>	<b>.5y</b>	<b>3y</b>
	<b>available</b>	<b>16</b>	

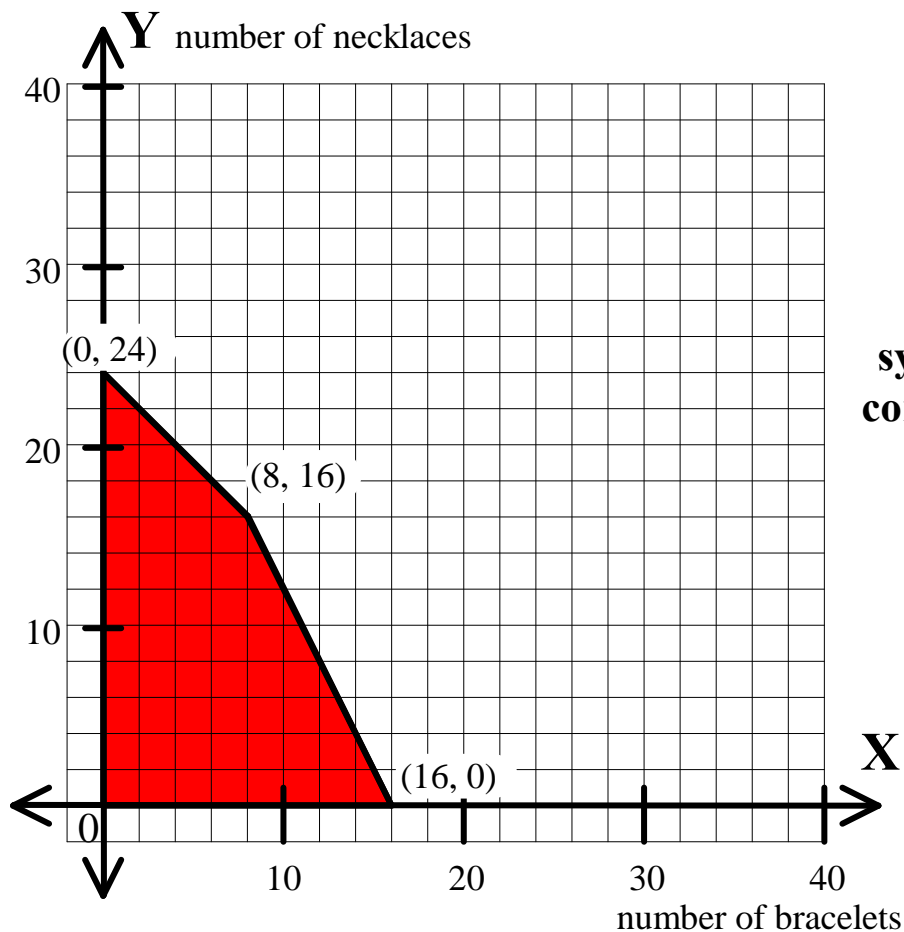
system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	<b>x</b>	<b>1x</b>	<b>4x</b>
necklaces	<b>y</b>	<b>.5y</b>	<b>3y</b>
	<b>available</b>	<b>16</b>	

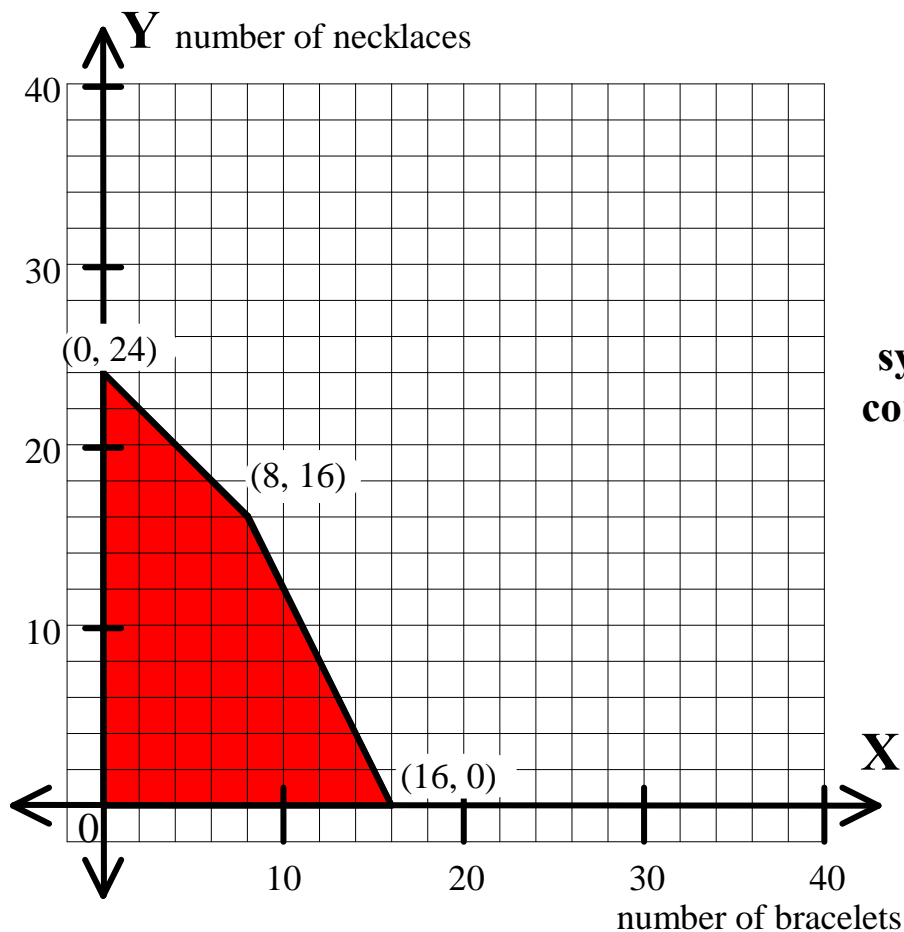
system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P =$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	<b>available</b>	<b>16</b>	

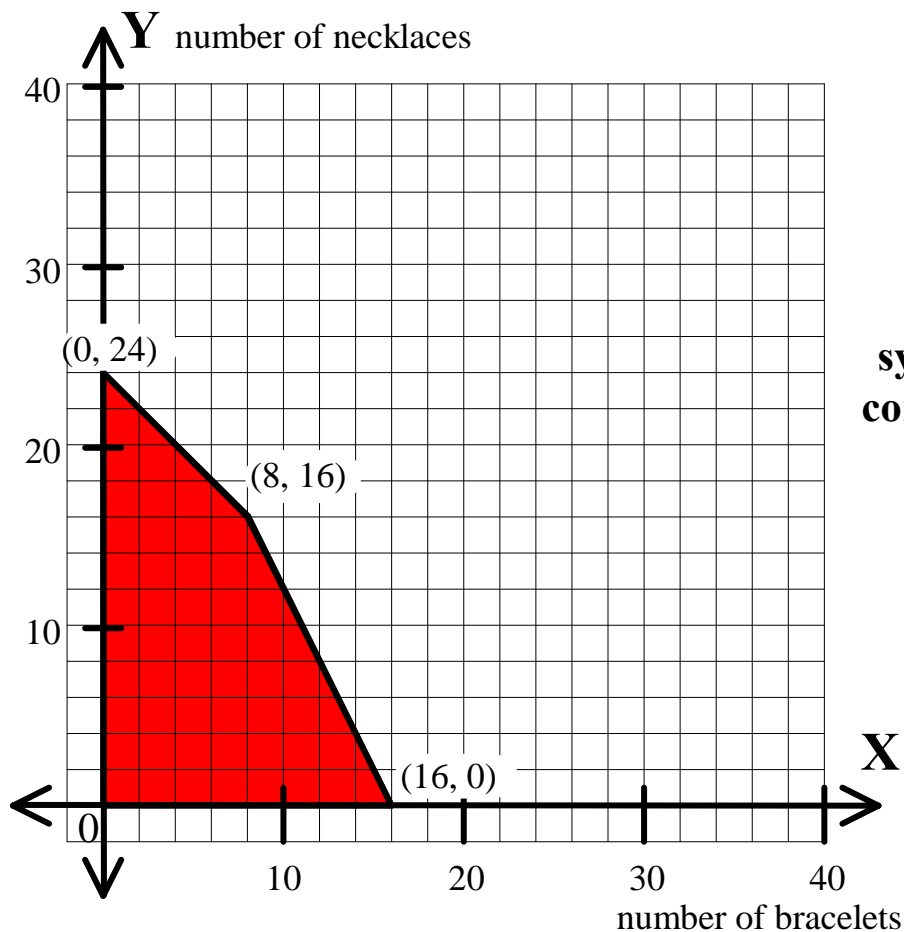
system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	<b>x</b>	<b>1x</b>	<b>4x</b>
necklaces	<b>y</b>	<b>.5y</b>	<b>3y</b>
	<b>available</b>	<b>16</b>	

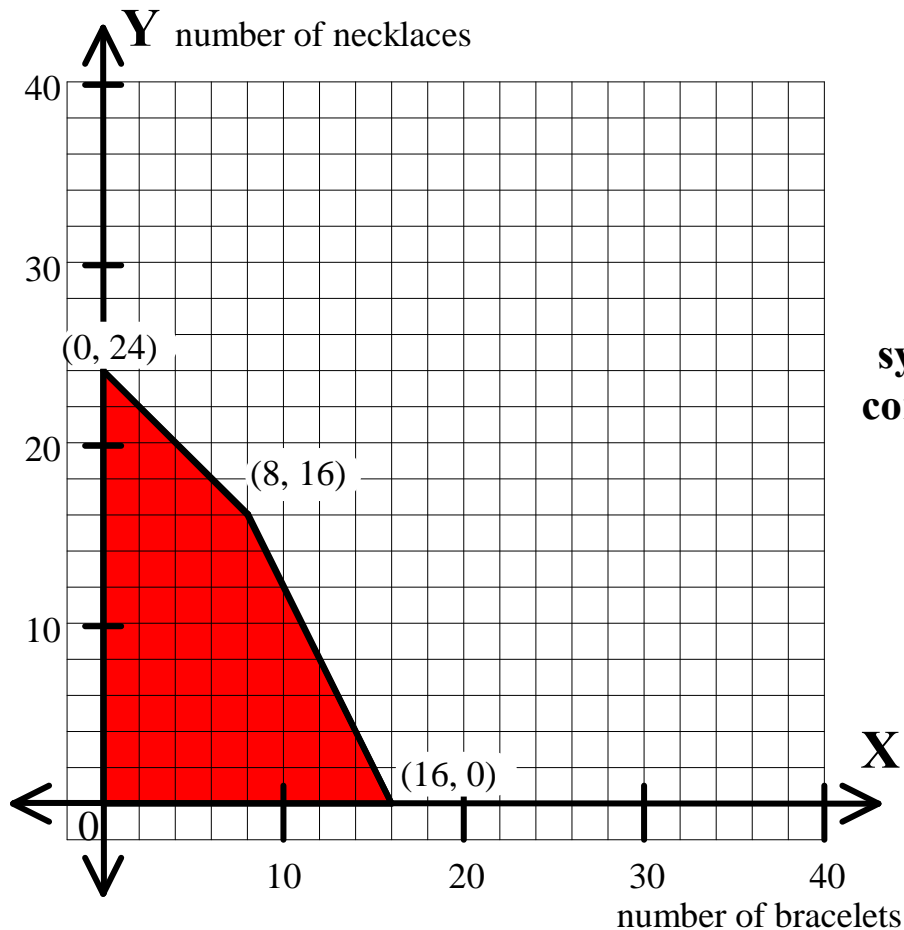
system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

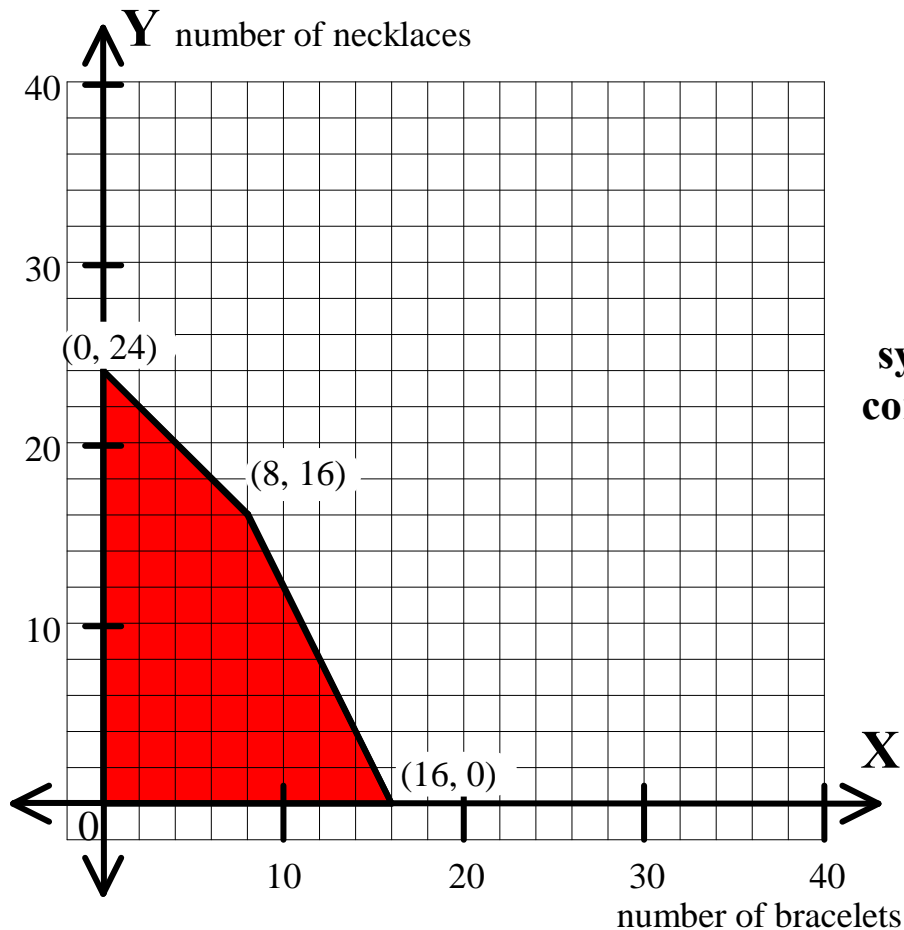
objective function  $\Rightarrow P = 4x + 3y$

**The maximum value of P will occur at a vertex of the region.**



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor	profit
	number	(hours)	(dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	16	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

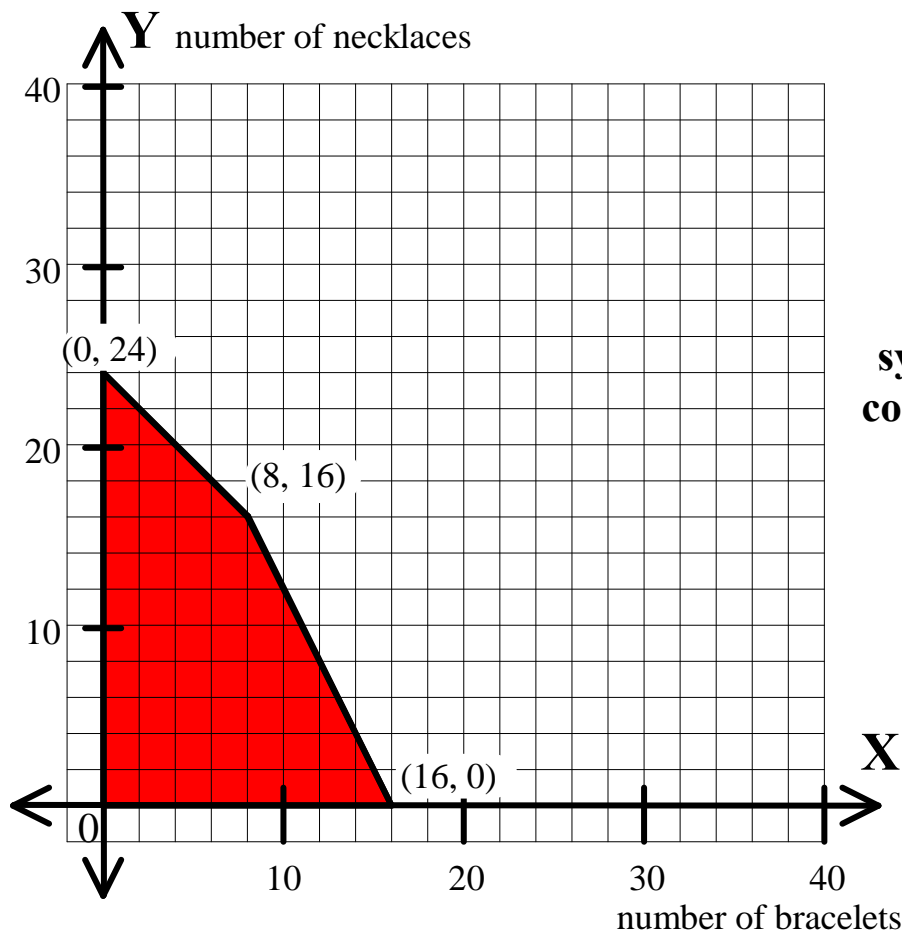
objective function  $\Rightarrow P = 4x + 3y$

At  $(0, 24)$

The maximum value of P will occur at a vertex of the region.

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
<b>bracelets</b>	<b>x</b>	<b>1x</b>	<b>4x</b>
<b>necklaces</b>	<b>y</b>	<b>.5y</b>	<b>3y</b>
	<b>available</b>	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

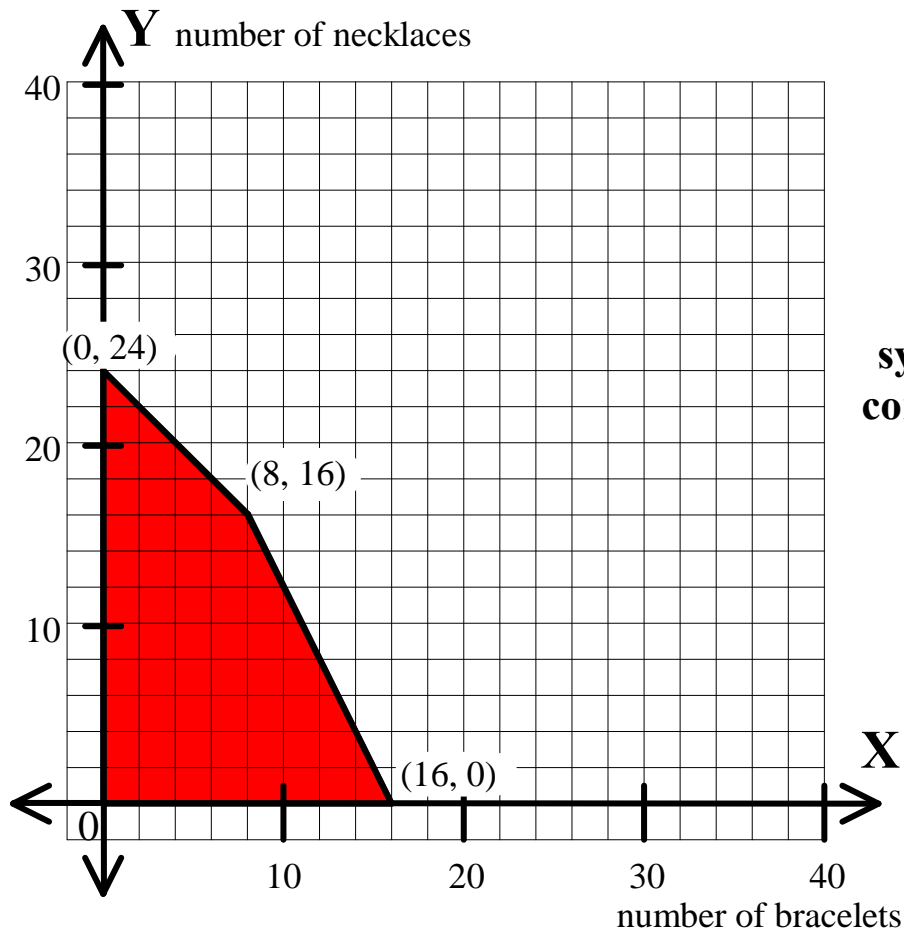
objective function  $\Rightarrow P = 4x + 3y$

The maximum value of P will occur at a vertex of the region.

At  $(0, 24) \Rightarrow P = 0 + 72 = 72$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

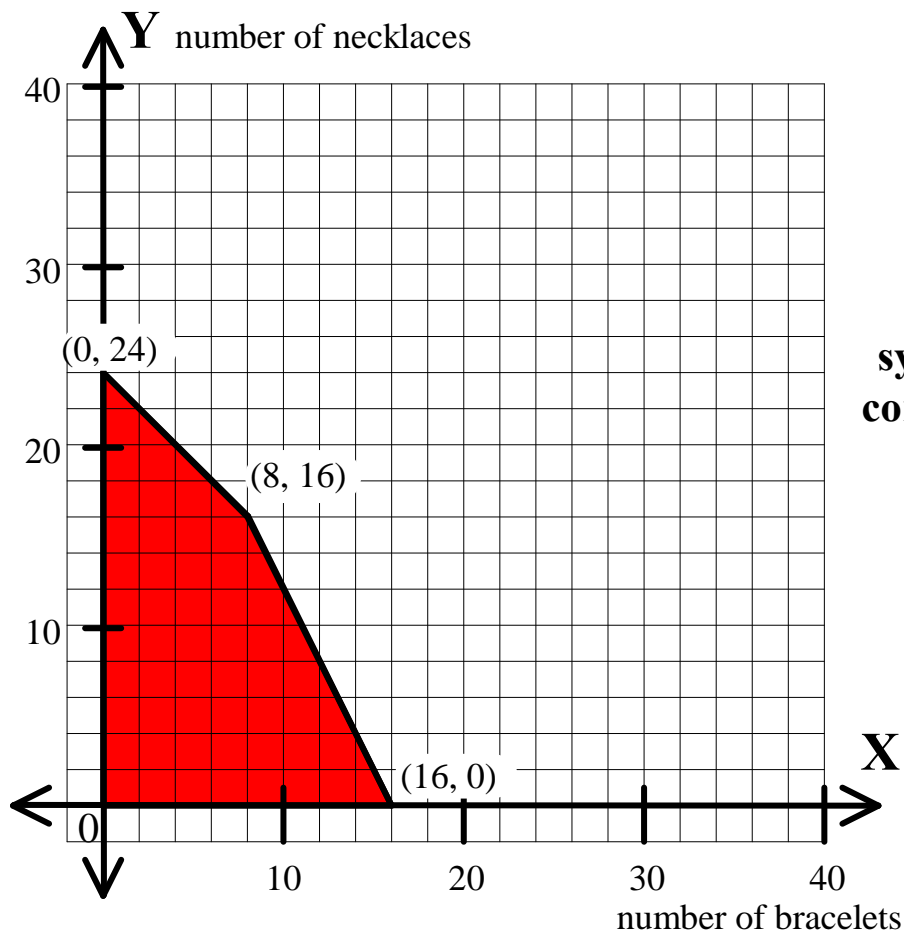
The maximum value of P will occur at a vertex of the region.

At (0,24)  $\Rightarrow P = 0 + 72 = 72$

At (8,16)

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

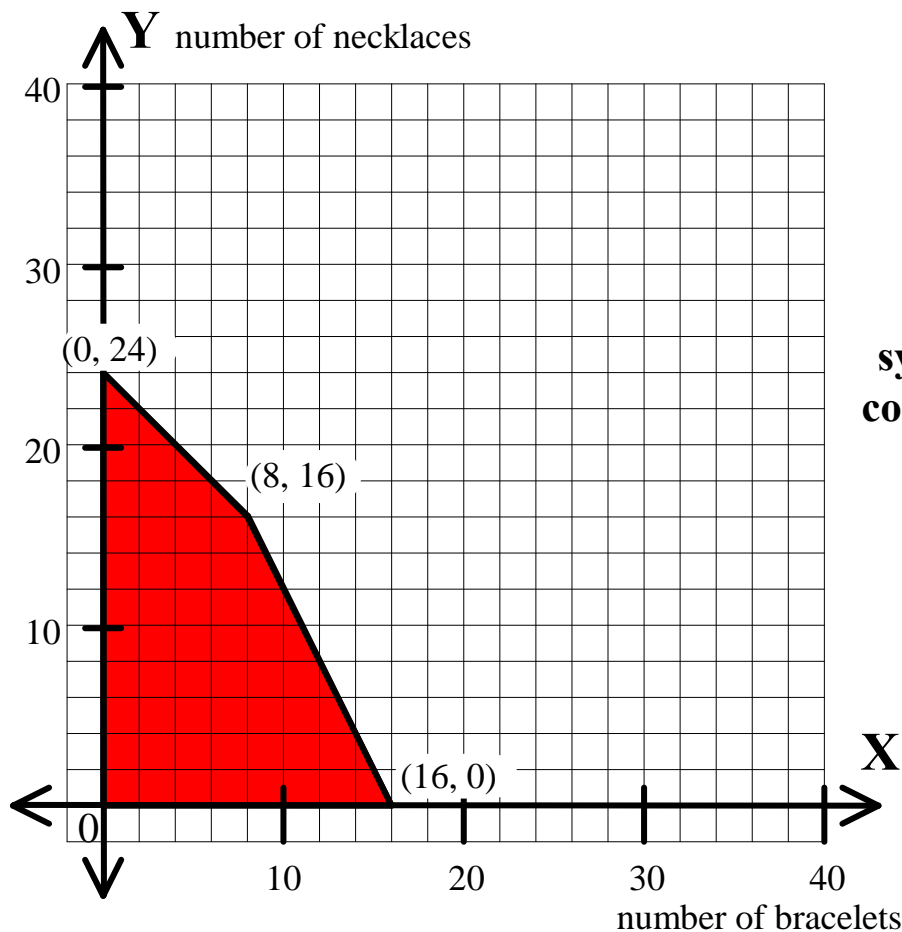
The maximum value of P will occur at a vertex of the region.

At  $(0, 24) \Rightarrow P = 0 + 72 = 72$

At  $(8, 16) \Rightarrow P = 32 + 48 = 80$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

The maximum value of P will occur at a vertex of the region.

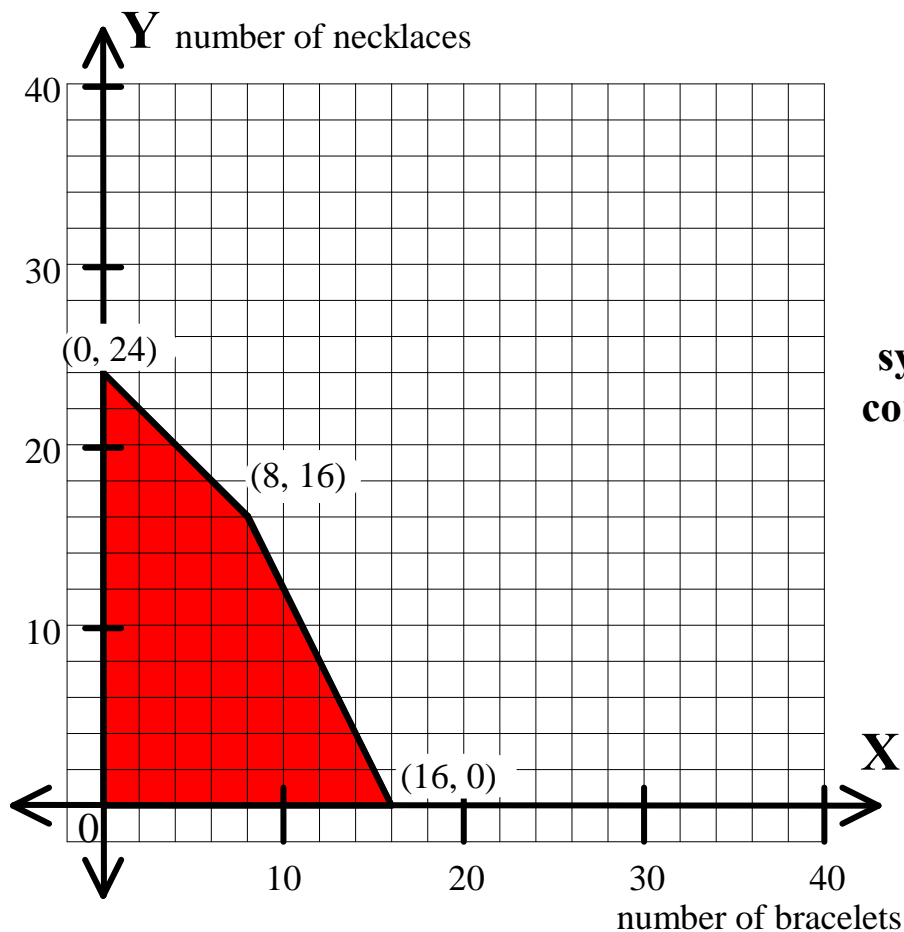
At (0,24)  $\Rightarrow P = 0 + 72 = 72$

At (8,16)  $\Rightarrow P = 32 + 48 = 80$

At (16,0)

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	$16$	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

The maximum value of P will occur at a vertex of the region.

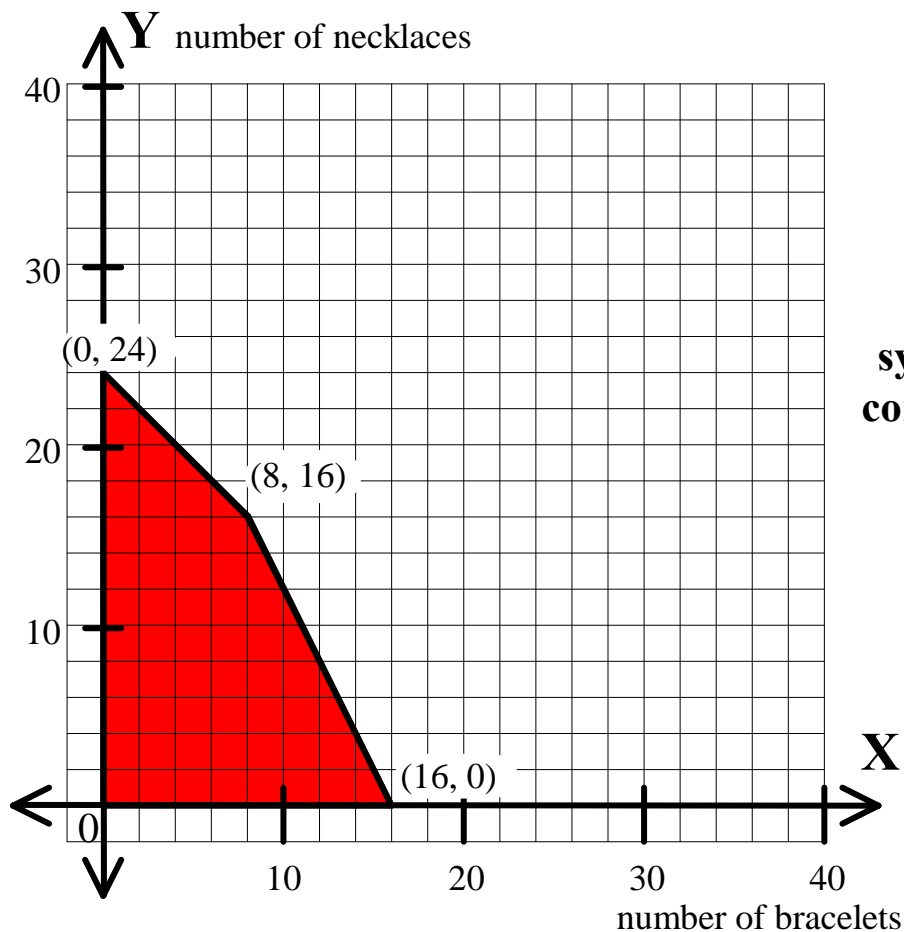
At (0,24)  $\Rightarrow P = 0 + 72 = 72$

At (8,16)  $\Rightarrow P = 32 + 48 = 80$

At (16,0)  $\Rightarrow P = 64 + 0 = 64$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	<b>16</b>	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

The maximum value of P will occur at a vertex of the region.

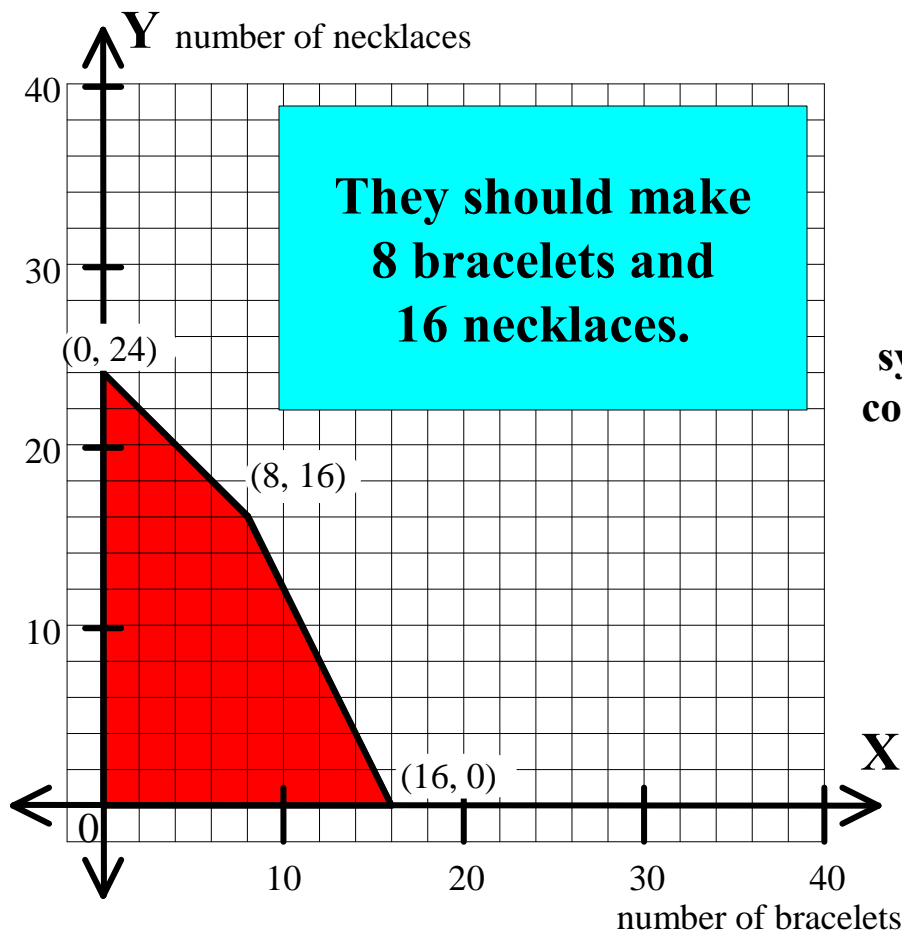
At  $(0, 24) \Rightarrow P = 0 + 72 = 72$

At  $(8, 16) \Rightarrow P = 32 + 48 = 80$

At  $(16, 0) \Rightarrow P = 64 + 0 = 64$

## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.



		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$
	available	$16$	

system of constraints

$$\begin{cases} x + y \leq 24 & \Rightarrow y \leq -x + 24 \\ x + .5y \leq 16 & \Rightarrow y \leq -2x + 32 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

objective function  $\Rightarrow P = 4x + 3y$

The maximum value of P will occur at a vertex of the region.

At (0,24)  $\Rightarrow P = 0 + 72 = 72$

At (8,16)  $\Rightarrow P = 32 + 48 = 80$

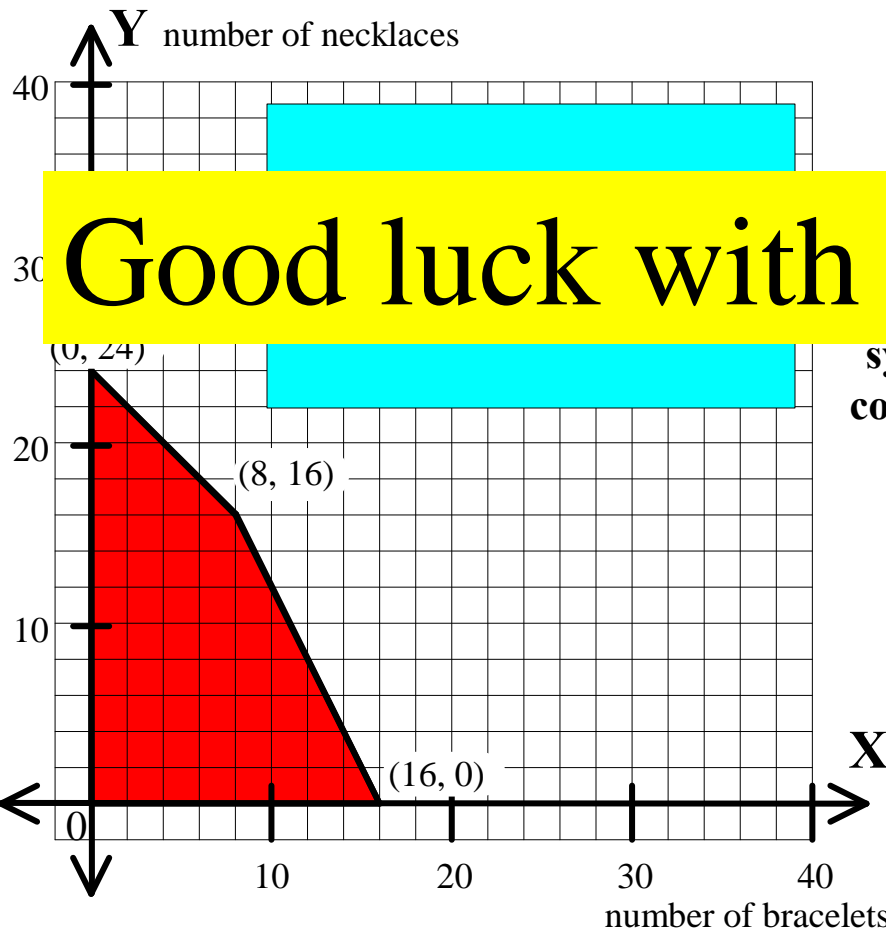
At (16,0)  $\Rightarrow P = 64 + 0 = 64$



## General Algebra II CWS #2 Unit 5

A small firm manufactures bracelets and necklaces. The total number of necklaces and bracelets it can manufacture per day is 24. Each bracelet requires 1 hour of labor to make, and each necklace requires .5 hours of labor to make. The total number of hours of labor available per day is 16. The profit on each bracelet is \$4, and the profit on each necklace is \$3. How many bracelets and how many necklaces should the company make per day in order to maximize its profits.

		labor (hours)	profit (dollars)
bracelets	$x$	$1x$	$4x$
necklaces	$y$	$.5y$	$3y$



**Good luck with your homework !!**

system of constraints

$$\begin{cases} x + .5y \leq 16 \\ x \geq 0 \\ y \geq 0 \end{cases} \quad \begin{cases} \longrightarrow \\ \longrightarrow \\ \longrightarrow \end{cases} \quad \begin{cases} y \leq -2x + 32 \\ \\ \end{cases}$$

objective function

$$\implies P = 4x + 3y$$

The maximum value of P will occur at a vertex of the region.

$$\text{At } (0,24) \implies P = 0 + 72 = 72$$

$$\text{At } (8,16) \implies P = 32 + 48 = 80$$

$$\text{At } (16,0) \implies P = 64 + 0 = 64$$

