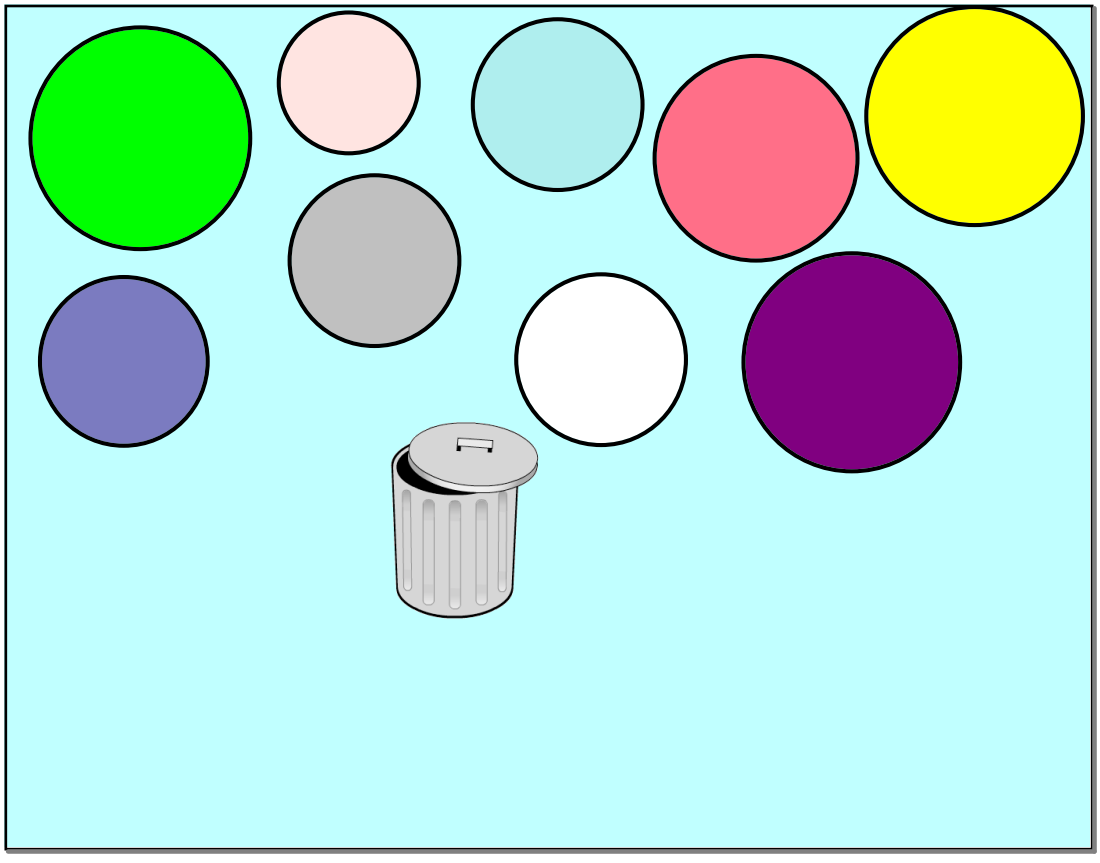
Algebra II - Review Chapter 3

Solving Systems by:
- Graphing
- Substitution
- Elimination

Graphing Linear and Absolute Value Inequalities
Solving Systems using 3 Variables
Solving Word Problems using Systems with 2 or 3 variables
Linear Programming
Calculator Problem - using Stat --> Calc --> Lin Reg
then finding the intersection using 2nd Trace (Calc)

Lesson objectives | Teachers' notes

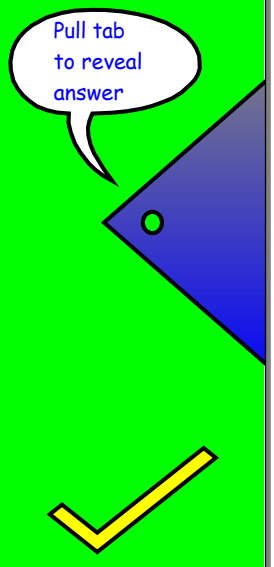
September 27, 2015



Solve by graphing:

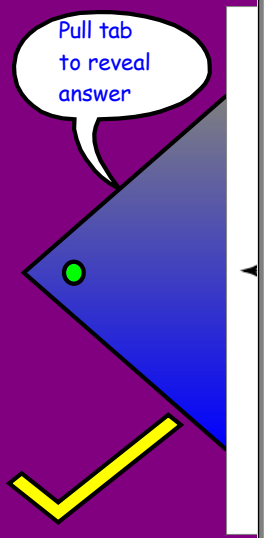
$2x - 3y > 12$

$y \leq -3|x + 2| + 5$



Solve by graphing:

$$3x + 2y \geq -2$$
$$x + 2y \leq 2$$

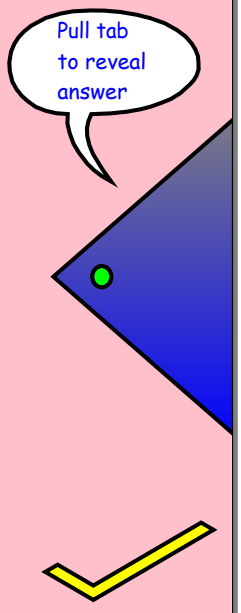


Solve the System. Write your answer as an ordered triple.

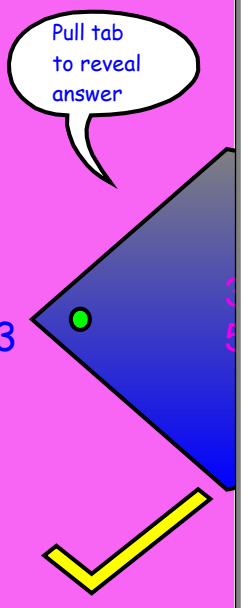
$x - y + 2z = 7$

$2x + y + z = 8$

$x - z = 5$



Solve the word problem by setting up a system, and solve by using substitution or elimination. Define your variables.

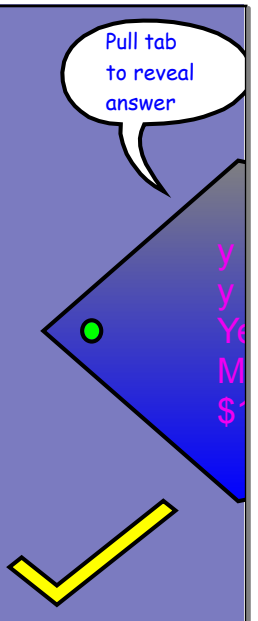


Tickets for your school's play are $3 for students and $5 for non-students. On opening night 937 tickets are sold and $3943 is collected. How many tickets were sold to students? to non-students?

Median Price of Homes (in thousands of $) for 1995-2000

Year	Northeast	South
5	126.7	97.7
6	127.8	103.4
7	131.8	109.6
8	135.9	116.2
9	139.0	120.3
10	139.4	128.3

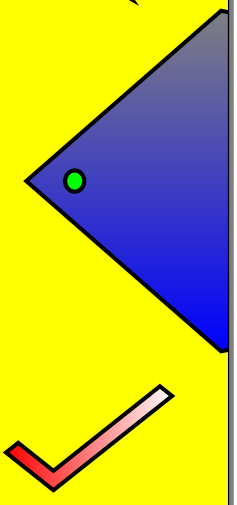
Use your calculator to find a linear model for each region. Round to two decimals. Use the models to predict in what year the median prices be the same. What will the median price of the homes be?



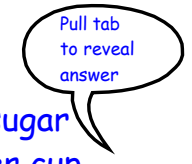
Solve using substitution.

$x - 5y = 12$

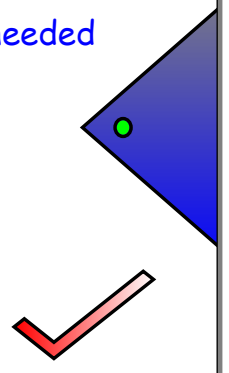
$-x + 5y = -4$



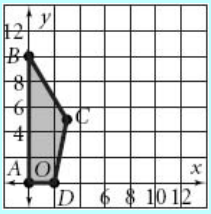
Set up a system of equations. Define your variables. Solve.



A 20 cup bag of cake mix contains cocoa, sugar and powdered milk. The cocoa costs $2 per cup, sugar costs $1.50 per cup and powdered milk costs $2.50 per cup. To manufacture the mix, a company needs to add twice as much sugar than cocoa. The cost of the bag of cake mix is $37.50 How much of each ingredient is needed to make the mix?



Name all the vertices. Then find the maximum value of the given objective function.



Maximize for $P = 2x + 3y$

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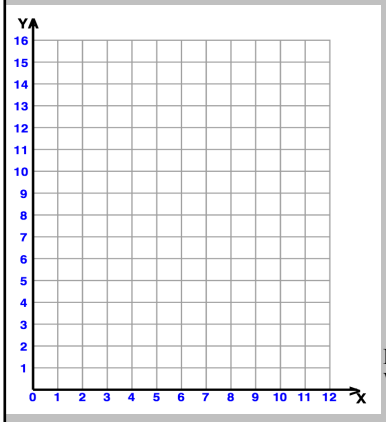
You are going to make and sell Irish soda bread and Kugelhopf cake. A loaf of Irish soda bread is made with 2 c flour and 1 c sugar. Kugelhopf cake is made with 4 c flour and 1 c sugar. You have 16 c flour and 3 c sugar. You will make a profit of $1.50 on each loaf of Irish soda bread and a profit of $4 on each Kugelhopf cake.



			Total/Limits	Inequality
# of(what is being produced?)				
Limitation # 1				
Limitation # 2				
Objective Function				

How many of each kind of bread should you make to maximize the profit?
What is the maximum profit?

HW - REVIEW Ch. 3
p. 121 #10
p. 163 #28, 29, 43-45
p. 138 #1-10 (skip 7)

Page 121: # 10

For Exercises 10–11, use your graphing calculator. Find linear models for each set of data. Use each model to predict the year in which the quantities will be equal.

10. **Annual U.S. Consumption of Vegetables**

Year	Broccoli (lb/person)	Cucumbers (lb/person)
1980	1.5	3.9
1985	2.6	4.4
1990	3.4	4.7
1995	4.3	5.6
1998	5.1	6.5
1999	6.5	6.8
2000	6.1	6.4

SOURCE: *Statistical Abstract of the United States.*
Go to **www.PHSchool.com** for a data update.
Web Code: agg-9041

11. **U.S. Life Expectancy at Birth**

Year	Men (years)	Women (years)
1970	67.1	74.7
1975	68.8	76.6
1980	70.0	77.4
1985	71.1	78.2
1990	71.8	78.8
1995	72.5	78.9
2000	74.3	79.7

SOURCE: U.S. Census Bureau.
Go to **www.PHSchool.com** for a data update.
Web Code: agg-9041

Answer:

10. Use 0 for 1980.

$$\begin{cases} y = 0.232x + 1.328 \\ y = 0.145x + 3.673 \end{cases}$$

about 2007

Page 163: All answers are in the back of the textbook

Graph each system of constraints. Find all vertices. Then find the variable values that maximize or minimize the objective function.

27. $\begin{cases} x \le 8 \\ y \le 5 \\ x \ge 0, y \ge 0 \end{cases}$

Minimum for $C = x + 5y$

28. $\begin{cases} x \ge 2 \\ y \ge 0 \\ 3x + 2y \ge 12 \end{cases}$

Minimum for $C = 4x + y$

29. $\begin{cases} 3x + 2y \le 12 \\ x + y \le 5 \\ x \ge 0, y \ge 0 \end{cases}$

Maximum for $P = 3x + 5y$

Solve each system.

43. $\begin{cases} x + y + z = 10 \\ 2x - y + z = 2 \\ -x + 2y - z = 5 \end{cases}$

44. $\begin{cases} x + 2y + z = 14 \\ y = z + 1 \\ x = -3z + 6 \end{cases}$

45. $\begin{cases} 3x + y - 2z = 22 \\ x + 5y + z = 4 \\ x = -3z \end{cases}$

Checkpoint Quiz: p. 138

Solve each system of equations.

1. $\begin{cases} 3x + 2y = 6 \\ x - 2y = 10 \end{cases}$

2. $\begin{cases} 4x + 7y = 28 \\ y = 2x - 14 \end{cases}$

3. $\begin{cases} 4x + 5y = -12 \\ 3x - 4y = 22 \end{cases}$

4. $\begin{cases} 3y - 2x = 7 \\ 2y - 2 = 4x \end{cases}$

5. The Village Inn offers two special packages. For two nights and three meals the cost is $158. For two nights and five meals the cost is $181. Write and solve a system of linear equations to find the costs per night and per meal.

6. **Smart Shopping** An ordinary refrigerator costs $489 and has an estimated annual operating cost of $84. An energy-saving model costs $599, with an estimated annual cost of $61. After how many years will the costs to buy and to operate the two models be equal?

7. Each week you must do a minimum of 18 hours of homework. Participation in sports requires at least 12 hours per week. You have no more than 35 hours per week in total to devote to these activities.
a. Write a system of inequalities to model the situation.
b. Graph and solve the system.

Solve each system of inequalities by graphing.

8. $\begin{cases} y \le -2 \\ y > |x + 1| \end{cases}$

9. $\begin{cases} 8x + 2y > 5 \\ x + 2y \le -3 \end{cases}$

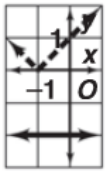
10. $\begin{cases} 4y < 3x - 1 \\ y > 2|x| - 3 \end{cases}$

Answers to Checkpoint Quiz

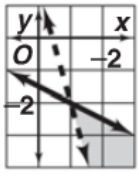
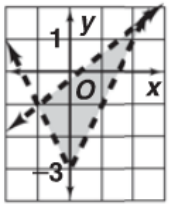
Checkpoint Quiz 1 **1.** (4, −3) **2.** (7, 0) **3.** (2, −4) **4.** (1, 3)

5. $\begin{cases} 2n + 3m = 158 \\ 2n + 5m = 181 \end{cases}$ $61.75 cost per night, $11.50 cost per meal **6.** approximately 4.8 years

8.



9.



10.