Chapter 5 Test Review

Sue is drawing two lines on an coordinate plane. She begins the first line at the origin and ends at (4,3). She begins the 2nd line at (0,4) and ends at (3,0). Where will these lines intersect?

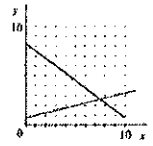
1. Mr. Frankel bought 7 tickets to a puppet show and spent $43. He bought a combination of child tickets for $4 each and adult tickets for $9 each. Which system of equations below will determine the number of adult tickets, a, and the number of child tickets, c, he bought?
   a. a = c – 9 and 9a + 4c = 43
   b. 9a + 4c = 43 and a + c = 7
   c. a + c = 301 and a + c = 50
   d. 4a + 4c = 50 and a + c = 7

2. Solve.

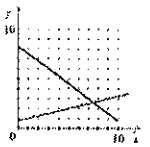
$$2x+\frac{1}{2}y=\frac{3}{4}$$
$$\frac{1}{2}x+\frac{3}{4}y=-\frac{3}{2}$$

3. Lena made 32 ounces of a fruit drink mix using pineapple juice and grapefruit juice. The number of ounces of pineapple juice in the fruit drink mix is 5 more than 2 times the number of ounces of grapefruit juice in the fruit drink mix. Which graph shows the number of ounces of pineapple juice, x, and the number of ounces of grapefruit juice, y, in the fruit drink mix? What system of equations was used to create the graph?

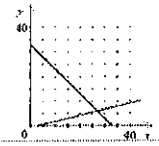
A. $x+y=32$, $x-5=2y$



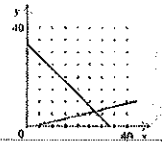
C. $5x+2y=32$, $x-5=2y$



B. $x+y=32$, $x+5=2y$



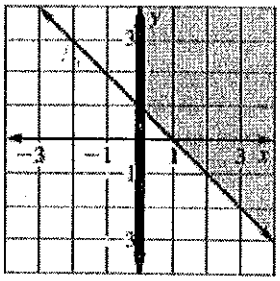
D. $5x+2y=32$, $x+5=2y$



4. Solve.
$$4x+5y=-10$$
$$\frac{1}{4}y+\frac{1}{5}x=2$$

5. **Graph** the system of inequalities
$$x\le 3$$
$$x-y<2$$
$$x-y\le -1$$

6. Write a system of inequalities for the shaded region.



7. **-4x+8y=-12**
   dy=-4x-12
   Describe possible values for *d* so that the linear system has...
   No solution
   Infinitely many
   One solution
   Identify each as consistent independent, consistent dependent, or inconsistent systems.

8. A store sells donuts and bagels. The table shows the time it takes to bake and decorate each dozen donuts and each dozen bagels and the time the store can devote to baking and decorating.

	Donuts	Bagels	Available
Time to bake (hours)	2	4	25
Time to decorate (hours)	1	1	3

a. Write and graph a system of inequalities for the number of x donuts and y bagels
b. Find the vertices
c. They make a profit of $P=5x+15y$. Which vertex results in the maximum profit?

9. -5x-10y=-20 my=-5x-20
Describe possible values for m so that the linear system has no solution.
Describe possible values for m so that the linear system has infinitely many solutions.
Describe possible values for m so that the linear system has exactly one solution.

10. A person's maximum heart rate (in beats per minute) is given by 220-x where x is the persons age in years ($20 \le x \le 65$). When exercising, a person should aim for a heart rate that is at least 70% of the maximum heart rate and at most 85% of the maximum heart rate.
Write and graph a system of inequalities that models the situation.
A 40-year old person's heart rate varies from 104 to 120 beats per minute while exercising. Does his heart rate stay in the suggested target range for his age?

11. You make necklaces and key chains to sell at a craft fair. The table shows the time that it takes to make each necklace and keychain, the cost of materials for each necklace and keychain and the time and money that you can devote to making necklaces and key chains
Write and graph a system of inequalities for the number of x of necklaces and the number of y of key chains that you can make under the given constraints. (make your graph by 10)
Find the vertices (corner points) of the graph.
You sell each necklace for $10 and each keychain for $8. The revenue R is given by the equation $R=10x+8y$. Find the revenue for each ordered pair in the second question. Which vertex has the maximum revenue?

	Necklaces	Key Chain	Available
Time to make (hours)	0.5	0.25	20
Cost to make (dollars)	2	3	120

12. A chemist needs 900mL of a 40% acid solution for a chemistry experiment. The chemist combines x mL of a 20% acid solution, and y mL of a 70% acid solution to make the 40% acid solution. How many mL of the 20% acid solution and the 70% acid solution are combined to make the 40% acid solution?

Answers (Solutions will be posted tomorrow)

1. (48/25, 36/25)
2. B
3. (21/20, -27/10)
4. A
5. No solution
6. Graph will be posted tomorrow
7. $x \geq 0; y \geq -x + 1$
8. No solution: d=-8 would give the same slope and different y-intercept making the lines parallel
   Infinite solutions: Not possible. By only changing the value of d, you cannot make both the slope and y-intercept the same.
   One solution: $d \neq -8$; the slopes must be different to intersect
9. a. $x + y \leq 3$
   $2x + 4y \leq 25$
   $x \geq 0$
   $y \geq 0$
   b. (3,0), (0,0), (0,3)
   c. (3,0)
10. No solutions: m=10; the same slope and different y-intercept will make the lines parallel
    Infinitely many: not possible; you cannot have the same slope and same y-intercept by only changing the m value.
    One solution: m cannot be 10. You must have different slopes so that the lines will intersect
11. Graph being posted tomorrow. A 40 year old with a heart rate between 104 and 120 is not within the recommended area.
12. Vertices: (0,0) $0, (0,40) $320, (40,0) $400; (30,20) $460. (30,20) has the greatest revenue
13. 540 mL of 20% solution and 360 mL of 70% solution

Ch. 5 Review

1. (0,0) (4,3) (0,4) (3,0)

$y = \frac{3}{4}x$

$y = -\frac{4}{3}x + 4$

$12\left(\frac{3}{4}x = -\frac{4}{3}x + 4\right)$

$9x = -16x + 48$

$25x = 48$

$x = \frac{48}{25}$

$y = \frac{3}{4} \cdot 12$

$y = \frac{3}{1}\left(\frac{48}{25}\right)$

$y = \frac{36}{25}$

$\left(\frac{48}{25}, \frac{36}{25}\right)$

2. a - adults
c - children

$a + c = 7$

$4c + 9a = 43$

Heller b.

3. $2x + \frac{1}{2}y = \frac{3}{4}$ 4 $\quad 8x + 2y = 3$

$\frac{1}{2}x + \frac{3}{4}y = -\frac{3}{2}$

$4\left(2x + 3y = -6\right)$

$8x + 12y = -24$

$\left(8x + 2y = 3\right)$

$10y = -27$

$y = -\frac{27}{10}$

$2x + \frac{1}{2}\left(-\frac{27}{10}\right) = \frac{3}{4}$

$2x - \frac{27}{20} = \frac{3}{4}$

$2x = \frac{15}{20} + \frac{27}{20}$

$\frac{2x}{2} = \frac{42}{20} \cdot \frac{1}{2}$

$x = \frac{21}{20}$

$\left(\frac{21}{20}, -\frac{27}{10}\right)$

4. $x + y = 32$

$x = 2xy + 5$

or

$x - 5 = 2y$

y - grapefruit
x - pineapple

letter A

5. $4x + 5y = -10$

$20\left(\frac{1}{4}y + \frac{1}{5}x = 2\right)$

$5y + 4x = 40$

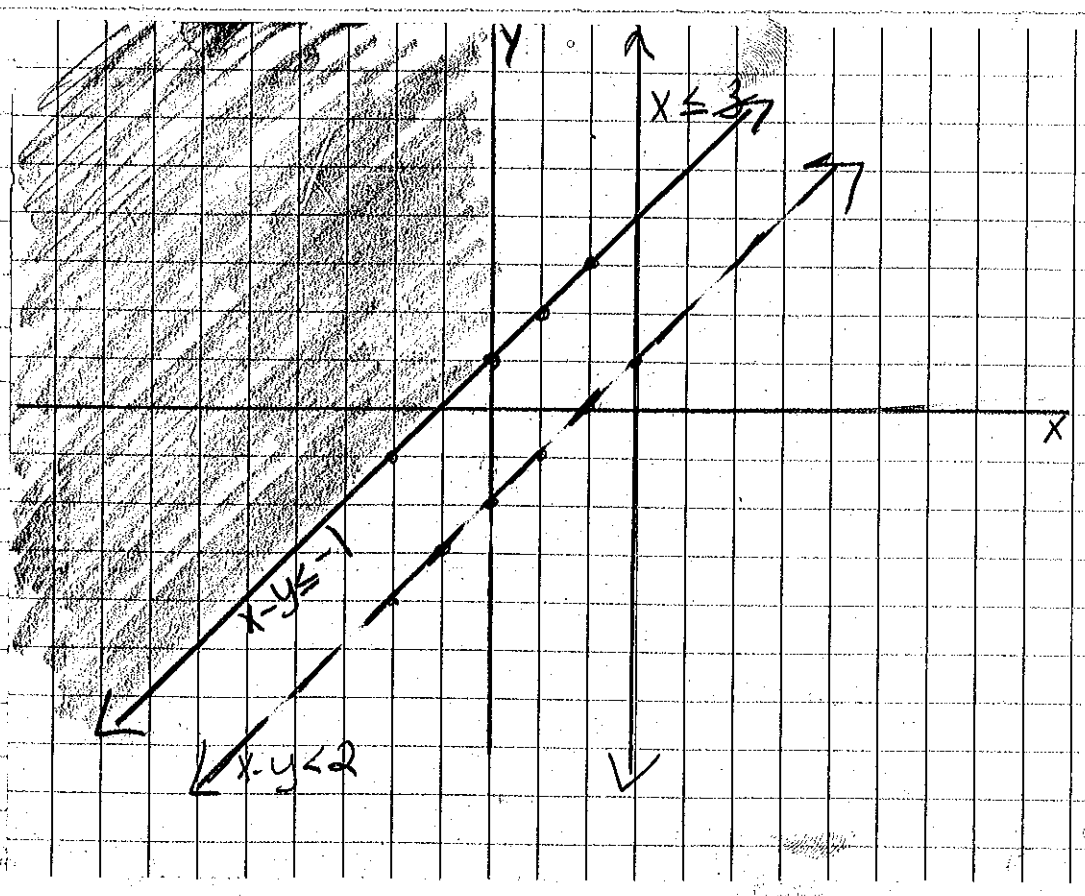
$5y + 4x = -10$

* notice x and y are not lined up.

same slope, different y-intercept means the lines are parallel.

NO solution.

6.



7. $x \geq 0$
$y \geq -x + 1$

8. $-4x + 8y = -12$
$dy = -4x - 12$
$4x + dy = -12 \rightarrow$
$-4x + 8y = -12$

slope: $\frac{-4}{d}$ y-int $\frac{-12}{d}$
slope: $\frac{1}{2}$ y-int: $\frac{-12}{8}$ or $\frac{-3}{2}$

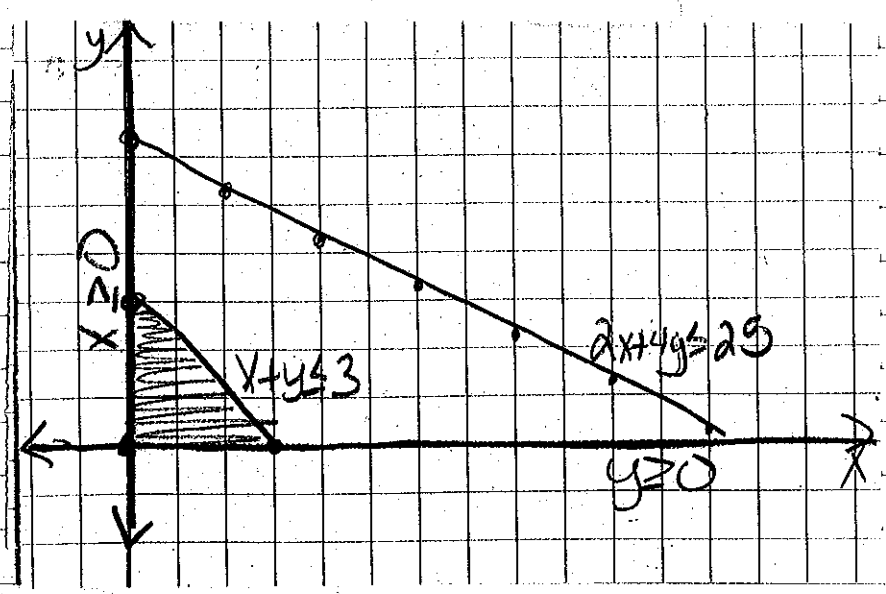
No solution
$d = -8$ would give the same slope and different y-intercept making the lines parallel.

Infinite # of solutions.
Not possible. By only changing the value of d you cannot make the slope and the y-intercept the same.

One solution
$d \neq -8$.
the slopes must be different so the lines will intersect.

9. x - donuts
y - bagels

$x + y \leq 3$
$2x + 4y \leq 25$
$x \geq 0$
$y \geq 0$



b. (3,0), (0,0) (0,3)

c. (3,0)

10. $-5x-10y=-20$ slope: $-\frac{1}{2}$ y-int: 2
$5x+my=-20$ slope: $-\frac{5}{m}$ y-int: $-\frac{20}{m}$

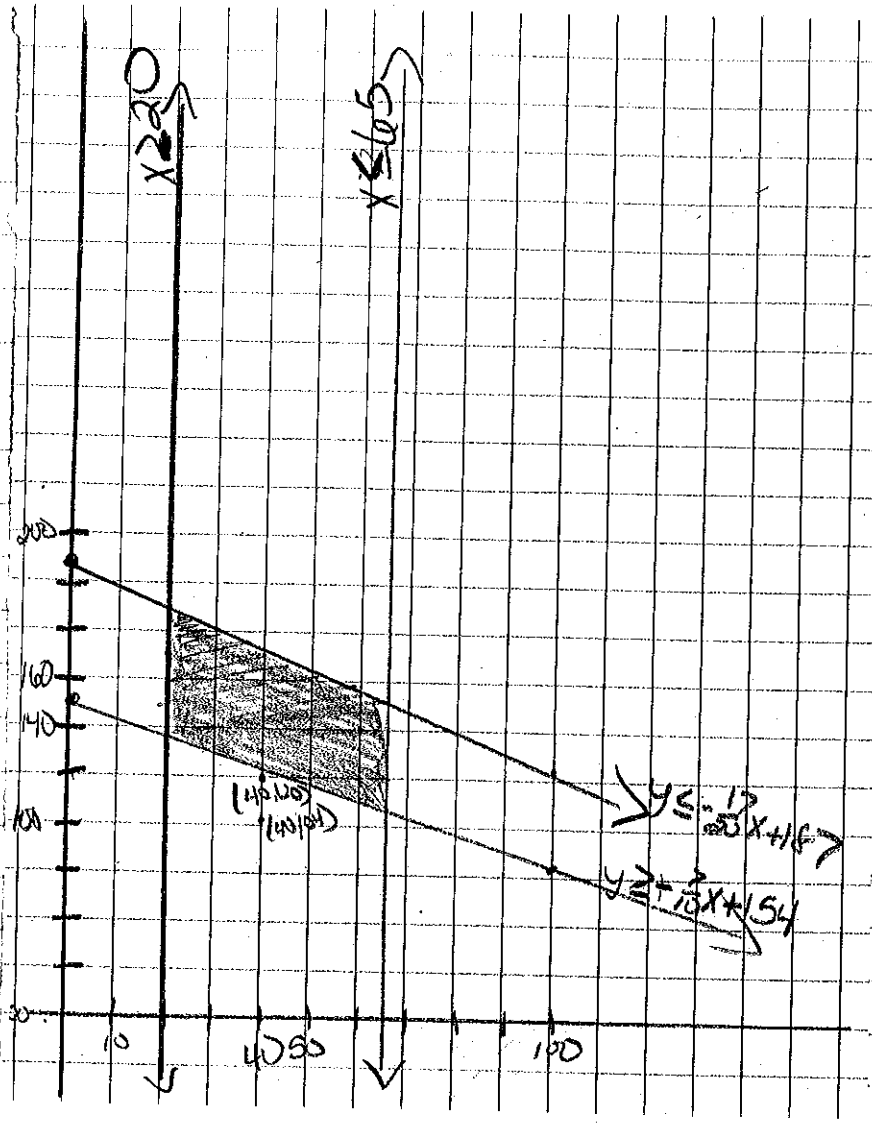
No solutions
$m=10$
the same slope and different y-intercept will make the lines parallel

Infinitely many solutions
Not possible.
you cannot have the same slope and same y-intercept by only changing m.

One solution.
$m \neq 10$.
the slopes must be different to intersect

11. $y \geq .7(220-x) \rightarrow y \geq 154 - .7x$
$y \leq .85(220-x) \rightarrow y \leq 187 - \frac{17}{20}x$
$x \geq 20$
$x \leq 65$

No a 40 year old with a heart rate between 70 and 120 is not within the recommended area.



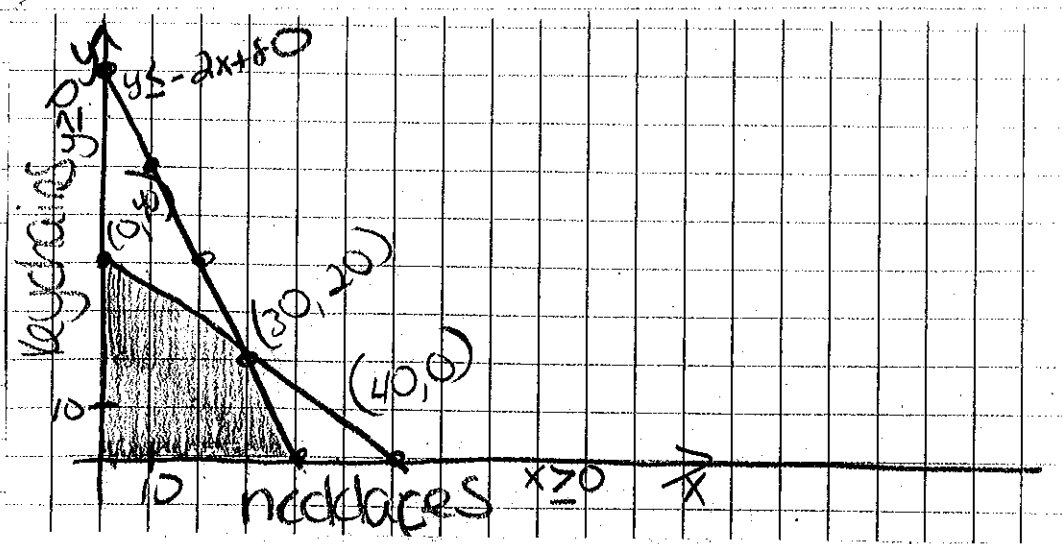
12. X = necklaces
y = keychains

$.5x + .25y \leq 20 \rightarrow y \leq -2x + 80$

$2x + 3y \leq 120 \rightarrow y \leq -\frac{2}{3}x + 40$

$x \geq 0$

$y \geq 0$



vertices:
(0,0), (0,400) (400,0) (30,20)
$0 #320 #400 #460
(30,20) has the greatest revenue.

13. 20% 70% 40%

$x = 20\%$
$y = 70\%$

$$x + y = 900$$
$$.2x + .7y = 360$$

$y = 900 - x$

$.2x + .7(900 - x) = 360$
$.2x + 630 - .7x = 360$
$-.5x = -270$
$x = 540$ mL of 20% solution
$y = 360$ mL of 70% solution