

Algebra 1 Review Chapter 7 Spring 2016

1. You want to make some fertilizer to spray on your garden. Right now all you have is some fertilizer that is 8% Nitrogen and some that is 20% Nitrogen. You want to make up 6 quarts of fertilizer that is 12% Nitrogen. How many quarts of each type of fertilizer do you need to mix together to end up with the desired 6 quarts of a 12% Nitrogen fertilizer?

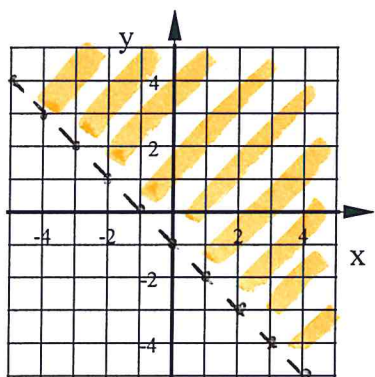
2. You and a friend are taking a canoe trip from your dock on the river to the water fall that is 6 miles away. Your trip upstream to get to the falls in the morning takes 4 hours. Your trip downstream to return to your dock in the afternoon takes 2 hours. Write and solve a system of equations to find the speed of the current in the river and the speed at which you can paddle the canoe.

3. You want to make a drink that is 10% sugar but only have drinks that are 8% sugar and 18% sugar. How many liters of each should you mix together in order to end up with 25 liters of the 10% drink?

4. You fly in your plane roundtrip to your cabin which is 540 miles away. The trip to your cabin takes 3.6 hours because you must fly into a headwind. The return trip takes only 2.7 hours because you fly with a tailwind. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

Graph each inequality on the xy-plane. Shade the solution region with a colored pencil or a highlighter.

5. $y < -2x + 4$ 6. $y \geq -2$ 7. $x < -3$
 8. $y > \frac{1}{3}x$ 9. $12x + 9y \geq 36$ 10. $20x - 12y \leq 60$
 11. Write the inequality that is shown in the graph below.



Graph each system of inequalities. Shade the solution region with a highlighter or a colored pencil.

12. $y \leq -\frac{1}{4}x - 1$ 13. $y > 2x$
 $6x - 8y > 24$ $10x + 5y \leq 20$

14. Solve each system of equations by graphing.

- | | | | |
|--------------------------------------|--|--|--|
| a. $y = -3x + 2$
$y = 2x - 3$ | b. $y = \frac{1}{2}x$
$y = -\frac{3}{2}x + 8$ | c. $y = 2x + 2$
$y = -\frac{1}{2}x - 8$ | d. $y = -\frac{1}{3}x$
$4x - 12y = -24$ |
| f. $y = -3x + 7$
$10x + 10y = 50$ | g. $y = -x - 2$
$4x - 2y = 16$ | h. $y = -6$
$-18x + 9y = -18$ | |
| i. $x = 4$
$24x - 48y = 144$ | k. $10x + 20y = 80$
$5x - 10y = 20$ | m. $4x + 4y = -28$
$12x - 6y = -48$ | n. $-8x + 4y = 16$
$6x + 6y = 6$ |

15. Without graphing tell if each system of equations has, NO SOLUTION, ONE SOLUTION, or MANY SOLUTIONS.

a. $y = 5x - 9$
 $y = -9x + 1$

b. $y = 2x + 3$
 $y = -\frac{1}{2}x + 7$

c. $y = 6x - 1$
 $y = 6x + 11$

d. $y = 4x + 10$
 $y = x + 10$

e. $y = 3x - 8$
 $24x - 8y = 64$

f. $y = 2x + 3$
 $2x - 4y = 12$

g. $y = -6x + 3$
 $12x + 2y = 4$

16. Solve each system of equations by substitution.

a. $y = 6x - 13$
 $y = -2x + 19$

b. $y = -x - 5$
 $y = 3x + 27$

c. $y = \frac{1}{2}x - 3$
 $y = -7x + 42$

d. $y = -x + 12$
 $y = -3x + 36$

e. $y = 2x - 7$
 $4x + y = 29$

f. $y = 4x - 5$
 $2x + 7y = -65$

g. $y = -3x + 71$
 $6x + 3y = 168$

h. $y = -x + 5$
 $5x + 2y = -11$

j. $x + y = 12$
 $3x + 4y = 41$

k. $x + y = 8$
 $8x + 12y = 93$

17. Solve each system of equations by using elimination.

a. $4x + 3y = 25$
 $6x - 3y = 15$

b. $9x - 5y = -26$
 $2x - 5y = -33$

c. $m + 8n = 36$
 $-4m + 3n = -4$

d. $3x - 2y = -11$
 $11x - 4y = -17$

e. $10j - 5k = 20$
 $3j + 8k = -13$

f. $7A + 4B = 19$
 $-9A + 3B = 57$

g. $6x + 12y = 30$
 $9x + 18y = 45$

h. $3x + 9y = 45$
 $4x + 12y = -48$

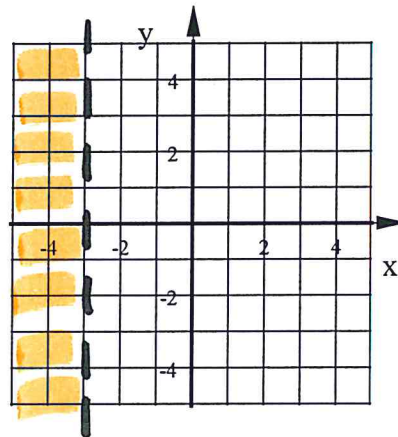
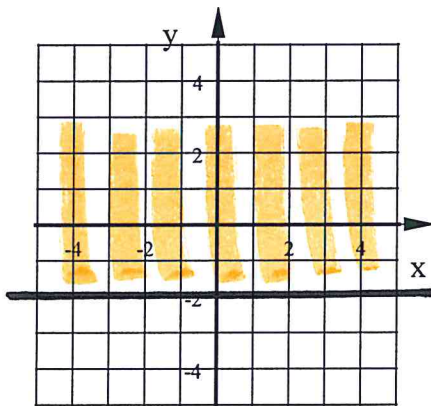
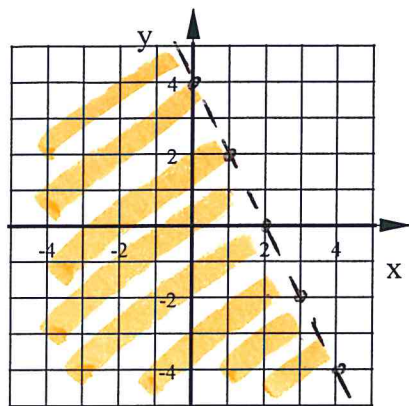
18. This past weekend you and some of your neighbors went to an amusement park. Four adults and six children cost \$294. The following weekend you went again with some of your relatives. Three adults and five children cost \$233. Write and solve a system of equations to find the price of an adult admission and the price of a child's admission.

19. Suppose you invest \$2500 for equipment to print designs on T-shirts that you will then sell. Each blank T-shirt will cost you \$3. Time to design and the ink to print costs you \$8 per t-shirt. After you've printed the design on the shirt you will sell them for \$25 each. How many shirts must you sell in order to break even?

20. The cost of a TV is \$24 less than three times the cost of a Camera. If somebody were to buy the 5 TV's and 2 Cameras on the shelf they would have to spend \$2090. Write and solve a system of equations to find the cost of a TV and the cost of a Camera.

21. You need some electrical work done at your house and need to decide between two electricians. One of the electricians will charge you \$80 to come to your house and \$20 an hour to do the work. The other electrician will charge you \$50 to come to your house and \$25 an hour to do the work. Write and solve a system of equations to find the number of hours of work for which the two electricians will have the same total charge.

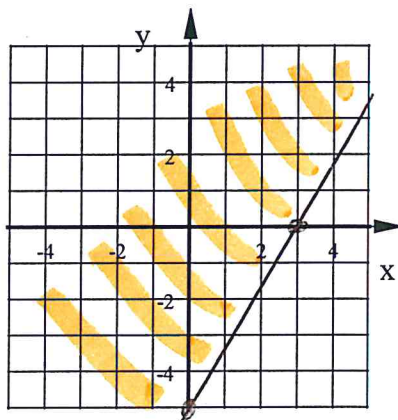
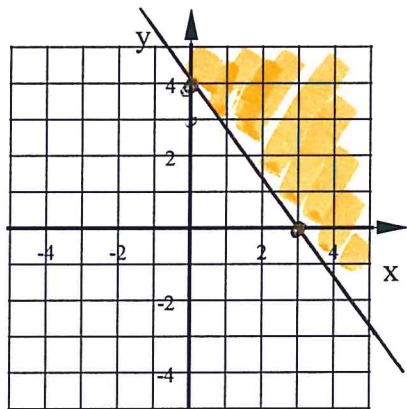
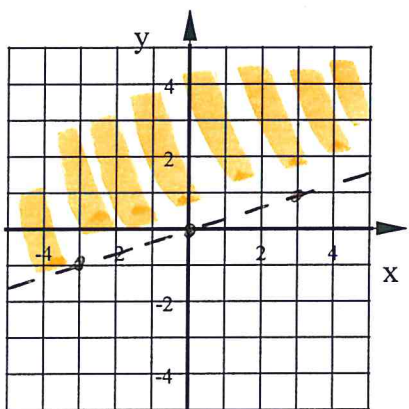
1. 4 quarts of the 8% Nitrogen fertilizer and 2 quarts of the 20% Nitrogen fertilizer.
2. Paddling speed = 2.25 mph Current speed = 0.75 mph
3. 20 liters of 8% and 5 liters of 18%
4. Plane speed = 175 mph. Wind speed = 25 mph.
- 5.
- 6.
- 7.



8.

9.

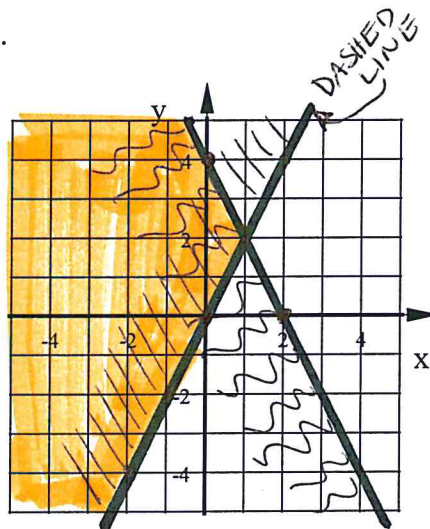
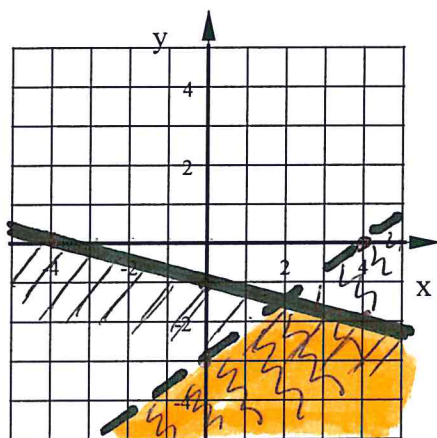
10.



11. $y > -x - 1$

12.

13.



14. a. $(1, -1)$ b. $(4, 2)$ c. $(-4, -6)$ d. $(-3, 1)$ f. $(1, 4)$ g. $(2, -4)$
h. $(-2, -6)$ i. $(4, -1)$ k. $(6, 1)$ m. $(-5, -2)$ n. $(-1, 2)$

15. a. One Sol b. One Sol c. No Sol d. One Sol e. Many Sol
f. One Sol g. No Sol

16. a. $(4, 11)$ b. $(-8, 3)$ c. $(6, 0)$ d. $(12, 0)$
e. $(6, 5)$ f. $(-1, -9)$ g. $(15, 26)$ h. $(-7, 12)$ j. $(7, 5)$ k. $(0.75, 7.25)$

17. a. $(4, 3)$ b. $(1, 7)$ c. $(4, 4)$ d. $(1, 7)$ e. $(1, -2)$ f. $(-3, 10)$ g. Many Sol h. No Sol

18. $4A + 6C = 294$ A =Adult admission is \$36 C =Children's admission is \$25
 $3A + 5C = 233$

19. Expenses: $2500 + 3T + 8T$ = Income: $25T$ T = # t-shirts
Break-even point = 208.33 → 209 t-shirts

20. Equations: $T = 3C - 24$ & $5T + 2C = 2090$
Variables: T = cost of a TV C = cost of a Camers
TV's cost \$366 Cameras cost \$130

21. Variables: T = total charge h = # hours
Equations: $T = 80 + 20h$ & $T = 50 + 25h$
 $h = 6$ hrs