Intermediate Algebra
Unit 1 Review

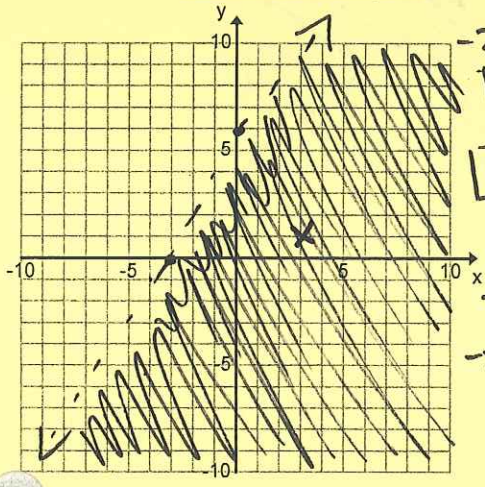
Name KEY
Period___Date_____

1.1 *I can demonstrate understanding of how to represent a region on a graph with an inequality.*

Level 1
Graph each inequality to find the solution region. List one possible solution for each inequality.

1. $-2x + y < 6$

Solution: (3, 1)

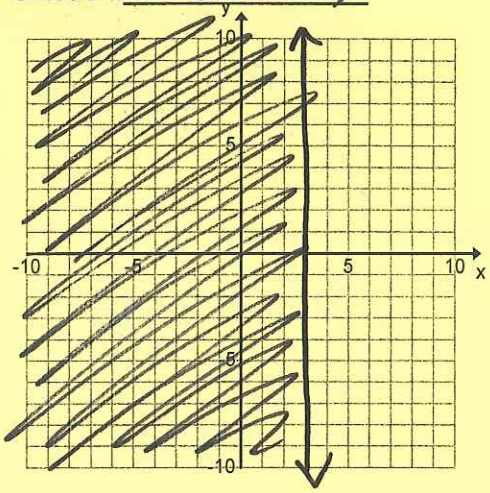


$-2x = 6$
$x = -3$
$y = 6$

Test: (0,0)
$-2(0) + 0 < 6$
$0 + 0 < 6$
$0 < 6$ ✓
TRUE

2. $x \leq 3$

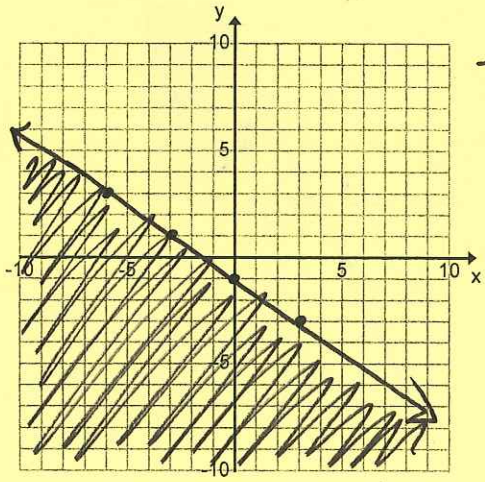
Solution: (-2, 1)



test: (0,0)
$0 \leq 3$ ✓
TRUE

3. $y \leq -\frac{2}{3}x - 1$

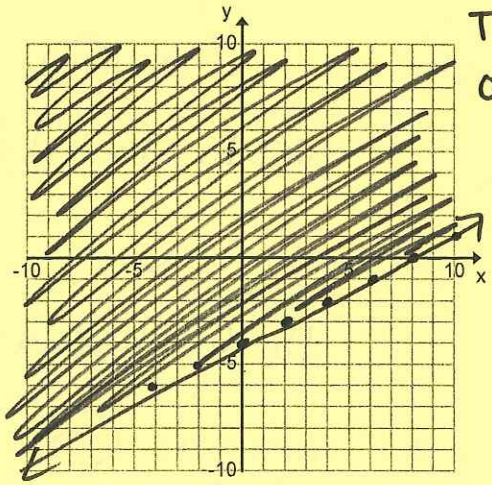
Solution: (-5, -1)



TEST: (0,0)
$0 \leq -\frac{2}{3}(0) - 1$
$0 \leq -1$
FALSE

4. $y \geq \frac{1}{2}x - 4$

Solution: (1, 2)



TEST: (0,0)
$0 \geq \frac{1}{2}(0) - 4$
$0 \geq -4$
TRUE

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Graph the system of inequalities to find the solution region. List one possible solution for the system.

5.

$4x - 2y \leq 14$

$y > -\frac{2}{3}x - 2$

Solution: (0,0)

$x = 14/4$

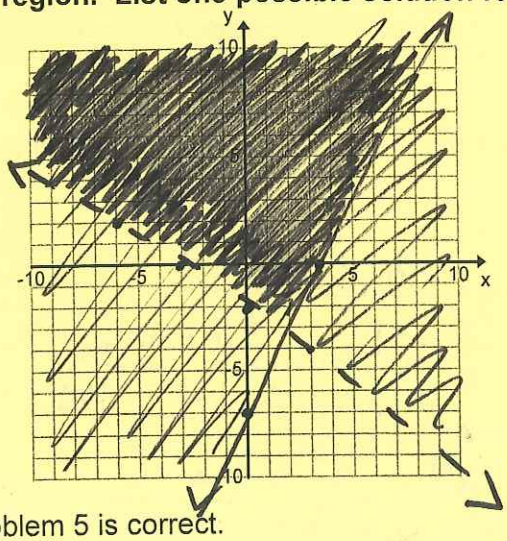
$y = -7$

$4(0) - 2(0) \leq 14$

$0 \leq 14$ ✓ TRUE

$0 > -\frac{2}{3}(0) - 2$

$0 > -2$ ✓ TRUE



6. Verify algebraically that the solution you chose in Problem 5 is correct.

WORK ABOVE

7. Given $-3x - 4y > 10$ determine algebraically if the following points are solution. Explain why or why not.

a. (2, -3)

$-3(2) - 4(-3) > 10$?

$-6 + 12 > 10$

$6 \not> 10$ NO

false

b. (0, 0)

$-3(0) - 4(0) > 10$

$0 > 10$ NO

false

c. (-1, -7)

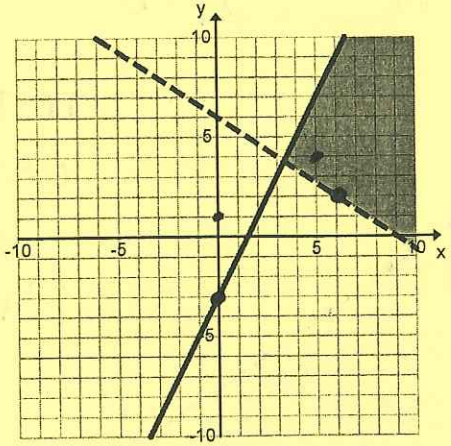
$-3(-1) - 4(-7) > 10$

$3 + 28 > 10$

$31 > 10$ YES

true

8. Use the graph of the system of inequalities to determine if each point is in the solution region. Explain why or why not for each point.



a. (0, 1) Solution: YES (NO)
Explanation: NOT in shaded region

b. (5, 4) Solution: (YES) NO
Explanation: IS in shaded region

c. (0, -3) Solution: YES (NO)
Explanation: NOT in shaded region

d. (6, 2) Solution: YES (NO)
Explanation: dashed line ... NOT in shaded region

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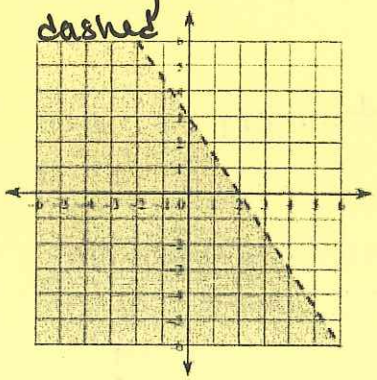
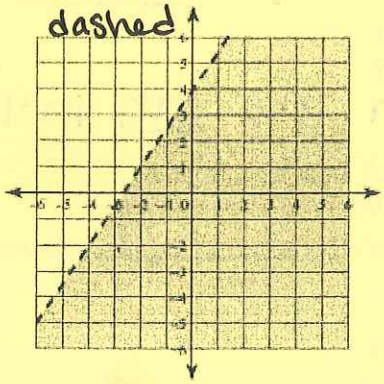
Write an inequality for each graph.

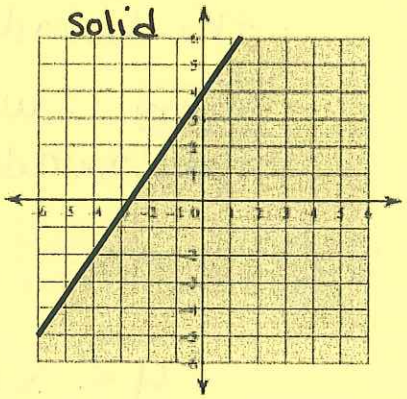
9. a. $y < -\frac{3}{2}x + 3$



b. $y < \frac{3}{2}x + 4$



c. $y \leq \frac{3}{2}x + 4$

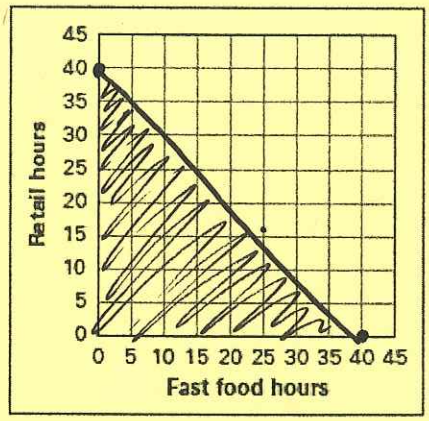


Level 2/3

10. A person less than 16 years of age can work up to 40 hours per week according to child labor laws. A 15 year old student plans on working two jobs this summer, one at a fast food restaurant and one at a retail store.

a. Write and graph an inequality that represents the possible number of hours the student can work. Let x represent the hours worked at the fast food restaurant and y the hours worked at the retail store.

$x + y \leq 40$



b. What does the point (10, 13) represent in this problem?
- 10 hrs. @ fast food restaurant
- 13 hrs. @ retail store

c. Is the point (10, 13) a solution? Why or why not?

YES, in shaded region.

d. What does the point (25, 16) represent in this problem?
- 25 hrs @ FF
- 16 hrs @ retail

e. Is the point (25, 16) a solution? Why or why not?

NO, not in shaded region

11. Admission prices were \$12 for adults and \$6 for students. The theater needs to make at least \$10,000. x y

a. Write an inequality to represent the amount of money made from ticket sales:

$12x + 6y \geq 10{,}000$

b. What is the minimum number of adult tickets the theater needs to sell to make at least \$10,000 if they have sold 1200 student tickets?

$12x + 6(1200) \geq 10{,}000$
$12x + 7{,}200 \geq 10{,}000$
$-7200 \quad -7200$

$12x \geq 2800$
$x \geq 233$ adult tix

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12. Explain the reason for needing dashed and solid lines when graphing linear inequalities.

- dashed is when you cannot include pts. on the boundary
- solid is when you can include pts. on the boundary

13. Write an inequality where (1, 3) is on the boundary line and not a solution and (5, 6) is not on the boundary line and is a solution.

$y < x+2$