Algebra 1

Name Key

Inequalities Test Review

Date _____

1) Will inequalities provide an exact answer?

Inequalities provide a range of answers.

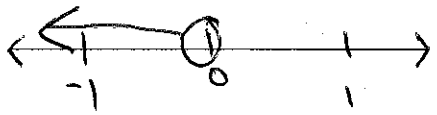
2) $-\frac{5t}{4}+2>2$

$-2 \quad -2$

$4\left(\frac{-5t}{4}\right)>(0)4$

$t<0$

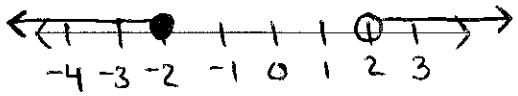
$\frac{-5t}{-5} > \frac{0}{-5}$



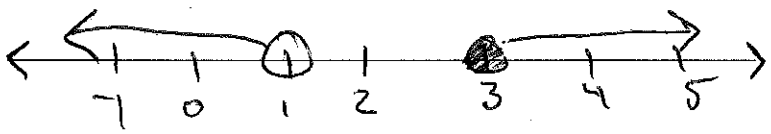
3) What is the difference between $x > 8$ and $8 > x$? They mean different things b/c the position of the terms are switched.

4) Write the inequality

$x \leq -2$ or $x > 2$



5) $\frac{n}{3} \geq 1$ or $8n < 8$



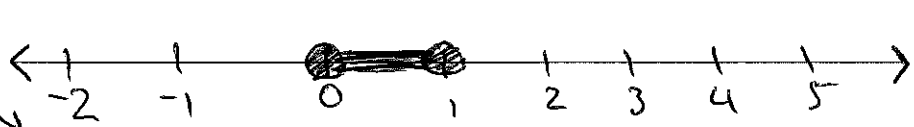
$3\left(\frac{n}{3}\right) \geq (1)3$

$n \geq 3$

$\frac{8n}{8} < \frac{8}{8}$

$n < 1$

6) $8m - 5 \leq 6 - 3m \leq 8m + 6$



$8m - 5 \leq 6 - 3m$

$+3m \quad +3m$

$11m - 5 \leq 6$

$+5 \quad +5$

$\frac{11m}{11} \leq \frac{11}{11}$

$m \leq 1$

$6 - 3m \leq 8m + 6$

$+3m \quad +3m$

$6 \leq 11m + 6$

$-6 \quad -6$

$\frac{0}{11} \leq \frac{11m}{11}$

$0 \leq m$

7) Mr. Rogers is baking some cookies for his advisory. He has already spent $9 on supplies but would also like to get candy. He doesn't want to spend more than $23 on all of the treats. If each bag of candy costs $1.25, then what is the most number of bags that Mr. Rogers can buy?

$9 + 1.25x \leq 23$

$-9 \quad -9$

$\frac{1.25x}{1.25} \leq \frac{14}{1.25}$

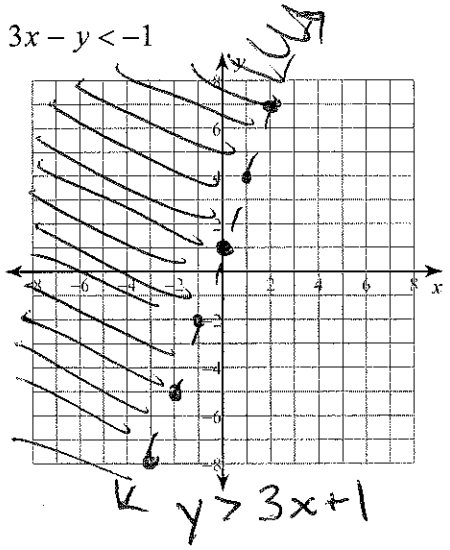
$x \leq 11.2$

At most, 11 bags of candy can be bought.

8) What does it mean for a point to be in the solution of a linear inequality?

↳ In the shaded region
↳ On the solid line
↳ Or makes the inequality true when substituted in.

9) $3x - y < -1$



$3x - y < -1$

$-3x \quad -3x$

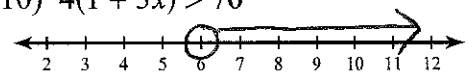
$\frac{-y}{-1} < \frac{-3x-1}{-1}$

$y > 3x + 1$

$y > 3x + 1$

Solve each inequality, graph its solution, and provide two solutions to the inequality.

10) $4(1 + 3x) > 76$



$4(1+3x) > 76$

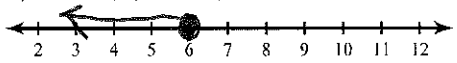
$4 + 12x > 76$

$-4 \quad -4$

$\frac{12x}{12} > \frac{72}{12}$

$x > 6$

11) $98 \geq 4(5n - 1) - 3n$



$98 \geq 4(5n-1) - 3n$

$98 \geq 20n - 4 - 3n$

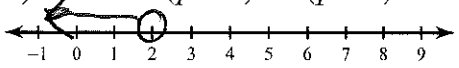
$98 \geq 17n - 4$

$+4 \quad +4$

$\frac{102}{17} \geq \frac{17n}{17}$

$6 \geq n$

12) $-14 < -3(p-4) - 5(p+2)$



$-14 < -3(p-4) - 5(p+2)$

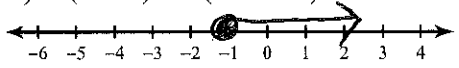
$-14 < -3p + 12 - 5p - 10$

$-14 < -8p + 2$

$-2 \quad -2$

$\frac{-16}{-8} < \frac{-8p}{-8}$ $\quad 2 > p$

13) $-(n-2) + 6(-5n-3) \leq 15$



$-(n-2) + 6(-5n-3) \leq 15$

$-n + 2 - 30n - 18 \leq 15$

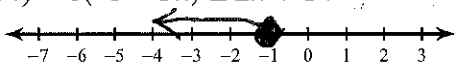
$-31n - 16 \leq 15$

$+16 \quad +16$

$\frac{-31n}{-31} \leq \frac{31}{-31}$

$n \geq -1$

14) $-6(-5-3n) \leq 2n + 14$



$-6(-5-3n) \leq 2n + 14$

$30 + 18n \leq 2n + 14$

$-2n \quad -2n$

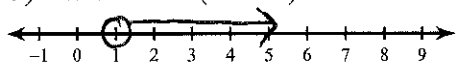
$30 + 16n \leq 14$

$-30 \quad -30$

$\frac{16n}{16} \leq \frac{-16}{16}$

$n \leq -1$

15) $5x + 25 < 3(5 + 5x)$



$5x + 25 < 3(5 + 5x)$

$5x + 25 < 15 + 15x$

$-5x \quad -5x$

$25 < 15 + 10x$

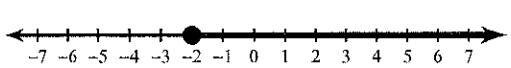
$-15 \quad -15$

$\frac{10}{10} < \frac{10x}{10}$

$1 < x$

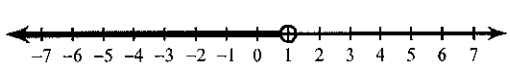
Write an inequality for each graph.

16)



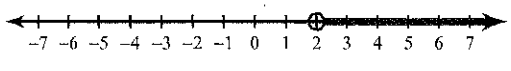
$x \geq -2$

17)



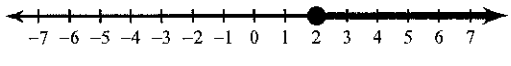
$x < 1$

18)



$x > 2$

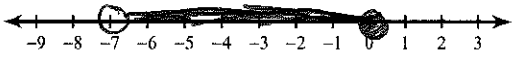
19)



$x \geq 2$

Solve each compound inequality, graph its solution, and provide two solutions to the inequality.

20) $7r - 7 \leq -7$ and $-3r - 2 < 19$



$7r - 7 \leq -7$ $\quad +7 \quad +7$

$\frac{7r}{7} \leq \frac{0}{7}$

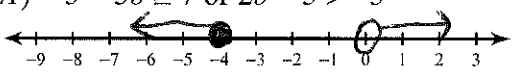
$r \leq 0$ and

$-3r - 2 < 19$ $\quad +2 \quad +2$

$\frac{-3r}{-3} < \frac{21}{-3}$

$r > -7$

21) $-5 - 3b \geq 7$ or $2b - 5 > -5$



$-5 - 3b \geq 7$ $\quad +5 \quad +5$

$\frac{-3b}{-3} \geq \frac{12}{-3}$

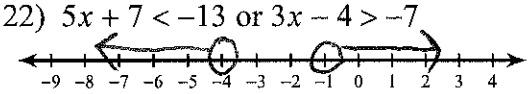
$b \leq -4$ or

$2b - 5 > -5$ $\quad +5 \quad +5$

$\frac{2b}{2} > \frac{0}{2}$

$b > 0$

22) $5x + 7 < -13$ or $3x - 4 > -7$



$5x + 7 < -13$ $\quad -7 \quad -7$

$\frac{5x}{5} < \frac{-20}{5}$

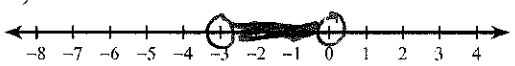
$x < -4$ or

$3x - 4 > -7$ $\quad +4 \quad +4$

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

$x > -1$

23) $8n + 4 < 4$ and $8 + 3n > -1$



$8n + 4 < 4$ $\quad -4 \quad -4$

$\frac{8n}{8} < \frac{0}{8}$

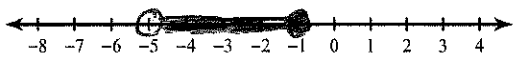
$n < 0$ and

$8 + 3n > -1$ $\quad -8 \quad -8$

$\frac{3n}{3} > \frac{-9}{3}$

$n > -3$

24) $-14 < 1 + 3x \leq -2$



$-14 < 1 + 3x$ $\quad -1 \quad -1$

$\frac{-15}{3} < \frac{3x}{3}$

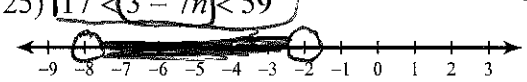
$-5 < x$ and

$1 + 3x \leq -2$ $\quad -1 \quad -1$

$\frac{3x}{3} \leq \frac{-3}{3}$

$x \leq -1$

25) $17 < 3 - 7n < 59$



$17 < 3 - 7n$ $\quad -3 \quad -3$

$\frac{14}{-7} > \frac{-7n}{-7}$

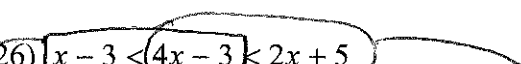
$-2 > n$ and

$3 - 7n < 59$ $\quad -3 \quad -3$

$\frac{-7n}{-7} < \frac{56}{-7}$

$n > -8$

26) $x - 3 < 4x - 3 < 2x + 5$



$x - 3 < 4x - 3$ $\quad +3 \quad +3$

$\frac{x}{-x} < \frac{4x}{-x}$

$\frac{0}{3} < \frac{3x}{3}$

$0 < x$ and

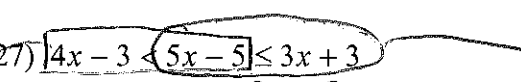
$4x - 3 < 2x + 5$ $\quad +3 \quad +3$

$\frac{4x}{-2x} < \frac{2x + 8}{-2x}$

$\frac{2x}{2} < \frac{8}{2}$

$x < 4$

27) $4x - 3 < 5x - 5 \leq 3x + 3$



$4x - 3 < 5x - 5$ $\quad -4x \quad -4x$

$-3 < x - 5$ $\quad +5 \quad +5$

$2 < x$

and

$5x - 5 \leq 3x + 3$ $\quad -3x \quad -3x$

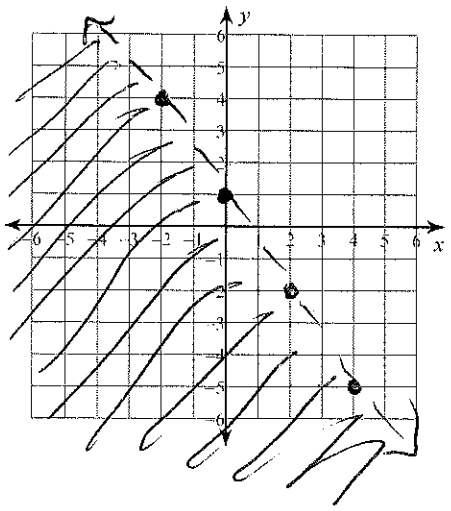
$2x - 5 \leq 3$ $\quad +5 \quad +5$

$\frac{2x}{2} \leq \frac{8}{2}$

$x \leq 4$

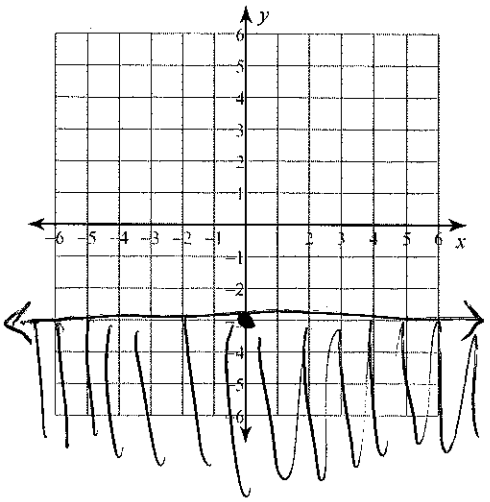
Sketch the graph of each linear inequality and indicate a point in the solution set.

28) $y < -\frac{3}{2}x + 1$



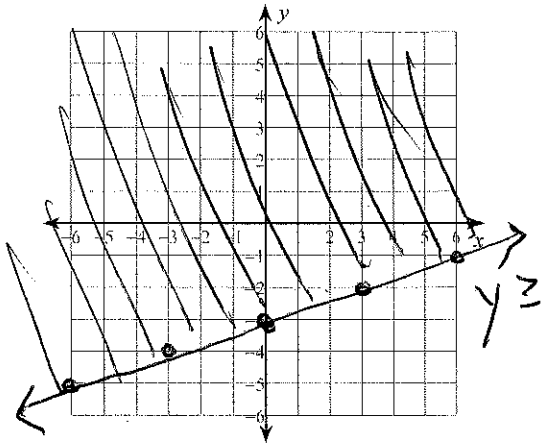
$y < -\frac{3}{2}x + 1$

29) $y \leq -3$



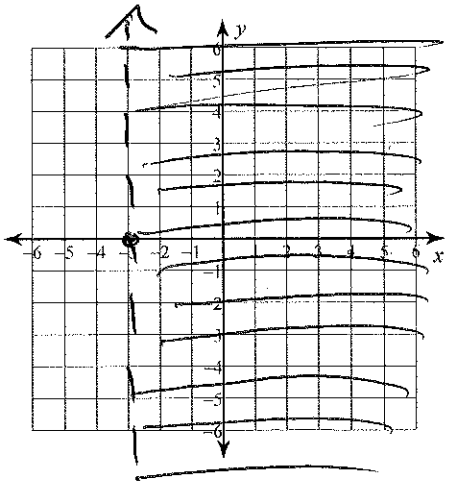
$y \leq -3$

30) $y \geq \frac{1}{3}x - 3$



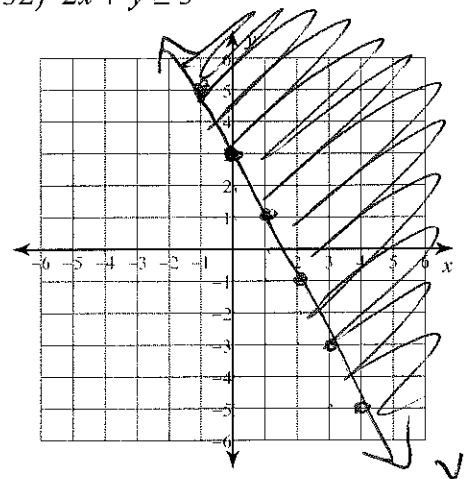
$y \geq \frac{1}{3}x - 3$

31) $x > -3$



$x > -3$

32) $2x + y \geq 3$



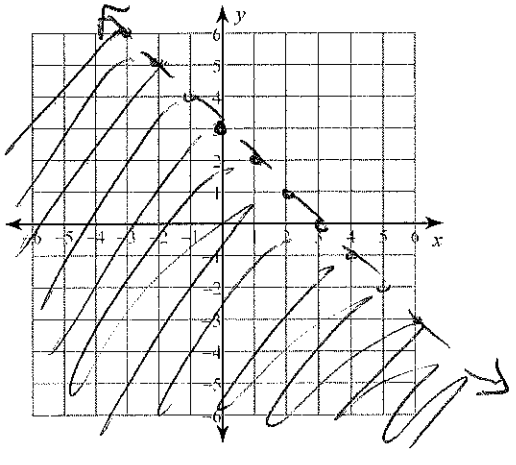
$y \geq -2x + 3$

$2x + y \geq 3$

$-2x \quad -2x$

$y \geq -2x + 3$

33) $x + y < 3$



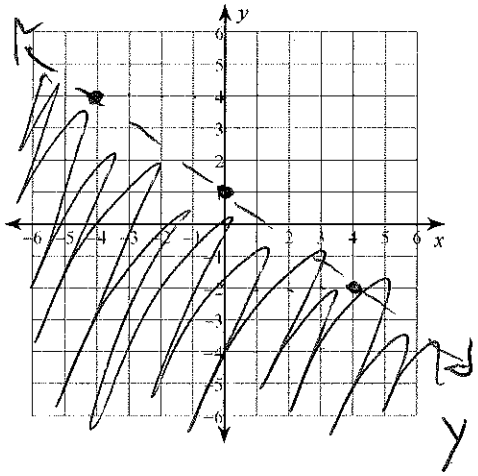
$y < -x + 3$

$x + y < 3$

$-x \quad -x$

$y < -x + 3$

34) $3x + 4y < 4$



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

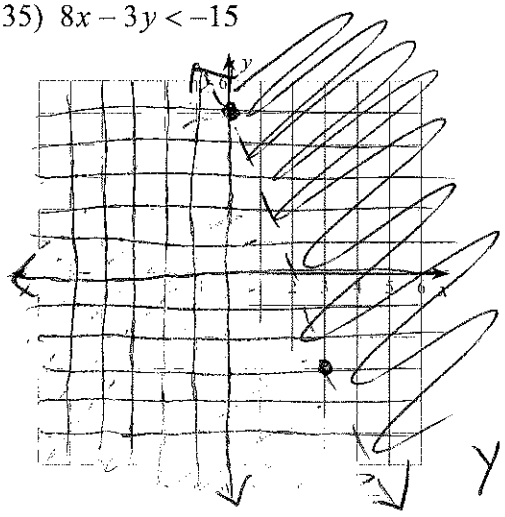
$3x + 4y < 4$

$-3x \quad -3x$

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

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

35) $8x - 3y < -15$



$y > \frac{8}{3}x + 5$

$8x - 3y < -15$

$-8x \quad -8x$

$\frac{-3y}{-3} < \frac{-8x - 15}{-3}$

$y > \frac{8}{3}x + 5$

Inequality Review Station 5

31. Nora is saving up money to buy a car. She already has $1,000 saved up and is working at an ice cream store to earn extra money. She needs $2,500 for the car and makes $11 an hour

a. Write an inequality that represents this situation. Be sure to define a variable.

$1000 + 11h \geq 2500$ $h = \#$ of hrs worked

b. solve your inequality to determine the number of hours Nora has to work to have enough money to buy the car. Make sure your answer uses an inequality phrase.

$1000 + 11h \geq 2500$
$-1000 \quad -1000$

$\frac{11h}{11} \geq \frac{1500}{11}$

$h \geq 136.4$

Nora must work at least 137 hrs to buy a car.

32. Justin is throwing a pizza party. There will be 7 people at the party in total and he wants there to be enough pizza for everyone to have at least 4 pieces of pizza and each pizza has 8 slices in it.

a. write an inequality that represents this situation. Be sure to define a variable.

$7 \cdot 4 = 28$ $x =$ pizza pies $8x \geq 28$

b. Solve your inequality to determine the number of pizzas Justin should order. Make sure to use an inequality phrase in your answer.

$\frac{8x}{8} \geq \frac{28}{8}$

$x \geq 3.5$

Justin must order at least 4 pies.

33. Robert is landscaping his backyard and wants to stay below his $1500 budget. He has already spent $650 on a new stone patio, $300 on flowers and $150 on mulch and grass. The only thing he still needs to get is trees. Each tree costs $55.

a. Write an inequality that represents this situation. Be sure to define a variable.

$x = \#$ of trees. $55x + 150 + 300 + 650 \leq 1500$

b. Sovle your inequality to determine the number of trees Robert can buy and still stay in his budget. Make sure your answer uses an inequality phrase.

$55x + 1100 \leq 1500$
$-1100 \quad -1100$

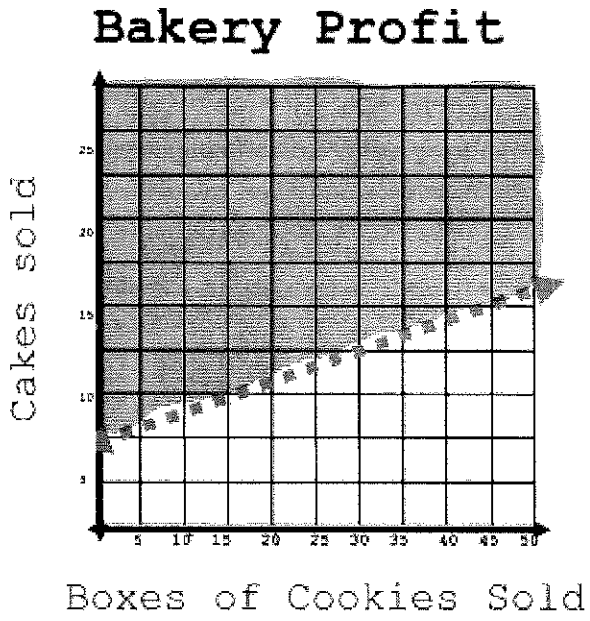
$\frac{55x}{55} \leq \frac{400}{55}$

$x \leq 7.\overline{27}$

Robert can buy, at most, 7 trees.

Inequality Station 6

34. The graph to the right shows the profits of a local profit in terms of cake and cookie sales.



a. Describe what the graph says.

How many cakes & cookies must be sold to make a profit.

b. If the bakery sells 20 boxes of cookies and 20 cakes, will it make a profit?

Yes.

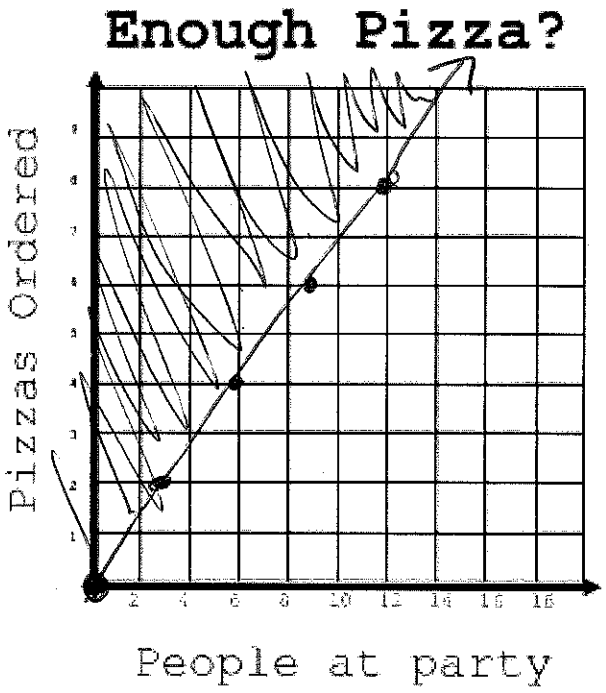
c. If the bakery sells 10 cakes and 30 boxes of cookies, will it make a profit?

No

d. If the bakery sells 15 boxes of cookies and 10 boxes of cookies, will it make a profit?

No

34. You're throwing a pizza party and want to represent the number of people at the party compared to the number of pizzas you order with a two variable inequality.



b. You figure out if you order at least 2 pizzas for every three people at the party. (so if there are 3 people at the party if you order 2 or more pizzas, you will have enough for everyone) Graph the situation on the graph – make sure it's an inequality.

c. Write an inequality that represents the situation.

$y \geq \frac{2}{3}x$