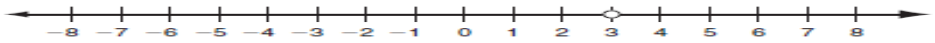
Graphing Basic Inequalities Due Exam Day

Graph $x \leq 3$.

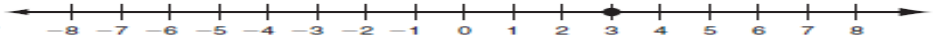
Step 1: Draw a circle on the number.



Step 2: Decide whether to fill in the circle.

If $>$ or $<$, leave empty.

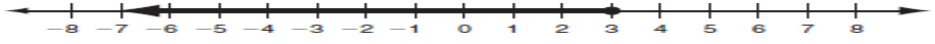
If $\geq$ or $\leq$, fill in.



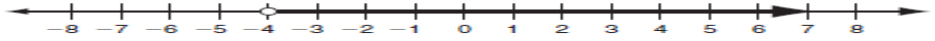
Step 3: Draw an arrow.

If $<$ or $\leq$, draw arrow to left.

If $>$ or $\geq$, draw arrow to the right.



Write the inequality shown by the graph.



Step 1: Write a variable and the number indicated by the circle. x ? -4

Step 2: Look at the direction of the arrow.

If arrow points left, use $<$ or $\leq$. $x >$ or ≥ -4

If arrow points right, use $>$ or $\geq$.

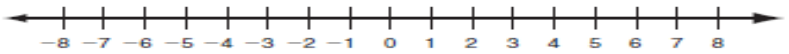
Step 3: Look at the circle.

If circle is empty, use $>$ or $<$.

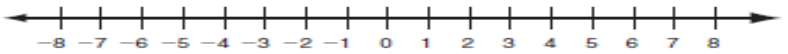
If circle is filled in use, $\geq$ or $\leq$. $x > -4$

Graph each inequality.

5. $m \geq 8 - 3$

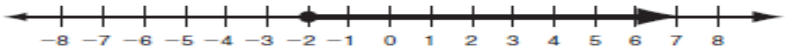


6. $p < 3.5$



Write the inequality shown by the graph.

7.



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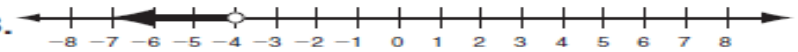


Graph each inequality.

5. $k > -12$

graph:

6. $-6\frac{1}{2} \leq w$

graph:

7. $b \leq 2^3 - 10$

graph:

8. $n < -\sqrt{2(5) + 6}$

graph:

Describe the solutions of each inequality in words.

1. $2m \geq 6$ _____
2. $t + 3 < 8$ _____
3. $1 < x - 5$ _____
4. $-10 \geq \frac{1}{2}c$ _____

Graph each inequality.

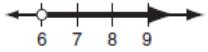
5. $x > -7$

6. $p \geq 2^3$

7. $4.5 \geq r$

8. $y < -\sqrt{14 - 5}$

Write the inequality shown by each graph.

9. 

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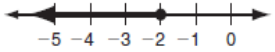
10. 

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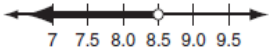
11. 

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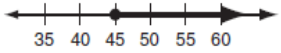
12. 

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Define a variable and write an inequality for each situation. Graph the solutions.

13. Josephine sleeps more than 7 hours each night.

_____

14. In 1955, the minimum wage in the U.S. was $0.75 per hour.

_____

Basic Inequalities

Define a variable and write an inequality for each situation.

15. To qualify for the job, applicants must have more than 3 years of experience in the field.

_____

16. As of Aug. 1996, the speed limit on rural interstates in North Carolina is 70 mph.

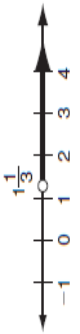
_____

17. In 2005, the minimum wage in the U.S. was $5.15 per hour.

_____

Write the inequality shown by each graph.

18. 

19. 

20. 

21. 

Solving Inequalities with Two Variables DUE EXAM DAY

Solving inequalities is just like solving equations with ONE MAJOR DIFFERENCE. In inequalities, negative coefficients require a sign direction change!

The Rules:

- Use the same processes of isolating the variable as you would an equation.
- Inequalities with an equal sign included: do not drop or add "equal to" signs. This is a primary cause of wrong answers in inequalities; people forget and drop the equal sign.
- When you get to the final step of clearing out the coefficient
  - If it is positive, you leave the sign alone.
  - If it is negative, you change the direction of the sign. *Flip the inequality!!*

That's it folks. Otherwise, it is just like equations.

Examples: $2x + 4 > 3x - 2$ same inequality moving small x value $2x + 4 > 3x - 2$

$-3x \quad -3x$ $\qquad$ $-2x \quad -2x$

$-x + 4 > -2$ $\qquad$ $+4 > x - 2$

$-4 \quad -4$ $\qquad$ $+2 \quad +2$

$(-1)\ -x > -6\ (-1)$ No sign Change $6 > x$

SIGN CHANGE!!! $x < 6$ is the same thing as $6 > x$

ALWAYS CHECK YOUR ANSWER!!!!! $X < 6$ PICK A NUMBER LESS THAN 6 (I PICK ZERO)

$0 < 6$ TRUE $\qquad$ $6 > 0$ TRUE

1. $b + 8 > 15$

2. $t - 5 \geq -2$

3. $-4 + x \geq 1$

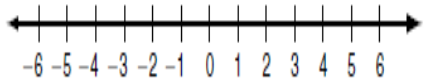
4. $g + 8 < 2$

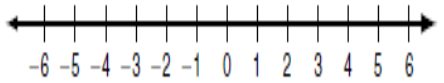
5. $-9 \geq m - 9$

6. $15 > d + 19$

1. $-2X > 6$

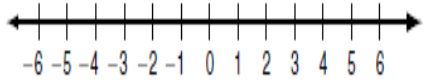
2. $\frac{a}{5} < 1$

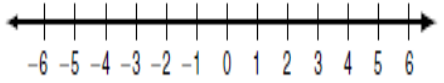




3. $\frac{3}{4}b > 3$

4. $-15Y < -30$





1. $2x + 30 \geq 7x$

2. $2k + 6 < 5k - 3$

3. $3b - 2 \leq 2b + 1$

4. $2(3n + 7) > 5n$

5. $5s - 9 < 2(s - 6)$

6. $-3(3x + 5) \geq -5(2x - 2)$

7. $1.4z + 2.2 > 2.6z - 0.2$

8. $\frac{7}{8}p - \frac{1}{4} \leq \frac{1}{2}p$

Solve each inequality.

9. $v + 1 > v - 6$

10. $3(x + 4) \leq 3x$

11. $-2(8 - 3x) \geq 6x + 2$

Write and solve an inequality for each problem.

9. A full-year membership to a gym costs $325 upfront with no monthly charge. A monthly membership costs $100 upfront and $30 per month. For what numbers of months is it less expensive to have a monthly membership?

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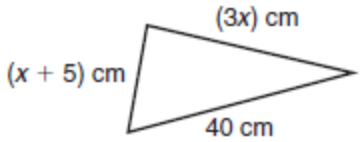
10. The sum of the lengths of any two sides of a triangle must be greater than the length of the third side. What are the possible values of x for this triangle?



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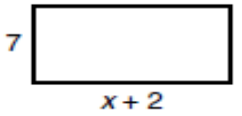
12. Ian wants to promote his band on the Internet. Site A offers website hosting for $4.95 per month with a $49.95 startup fee. Site B offers website hosting for $9.95 per month with no startup fee. For how many months would Ian need to keep the website for Site B to be less expensive than Site A?

_____

13. For what values of x is the area of the rectangle greater than the perimeter?



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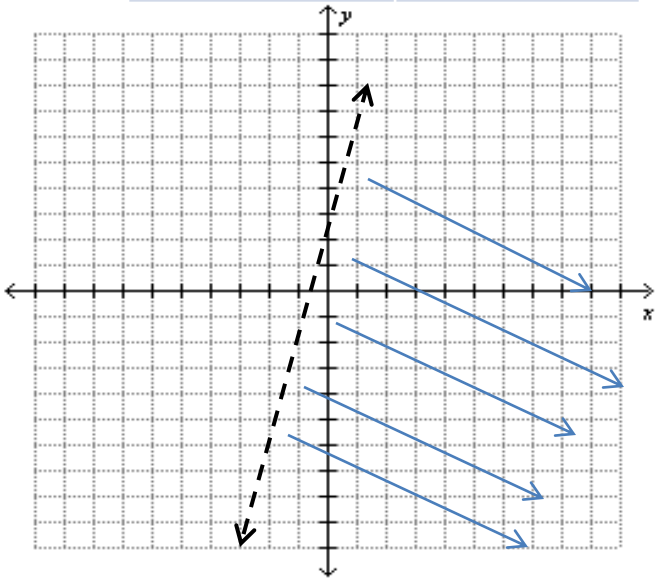
Graphing Inequalities of the y > mx +b form

- Graphing an inequality in y+ form is not that different than graphing an equation of the y=mx+b form. First you locate the line of the graph as if it were y = mx +b, then you get fancy with it. Remember open circles were used when there was no = sign in your equality? Well, now you use a dotted (dashed0 line with open spaces between the dashes. AS solid line means it has an = sign also. Then you have to "shade" up for greater than, down for less than. Examples:

Y < 3 x + 2 I make a box to make sure I do it all right

Slope = 3/1	Y intercept = 2
No equal sign…dotted line	Less than shade down

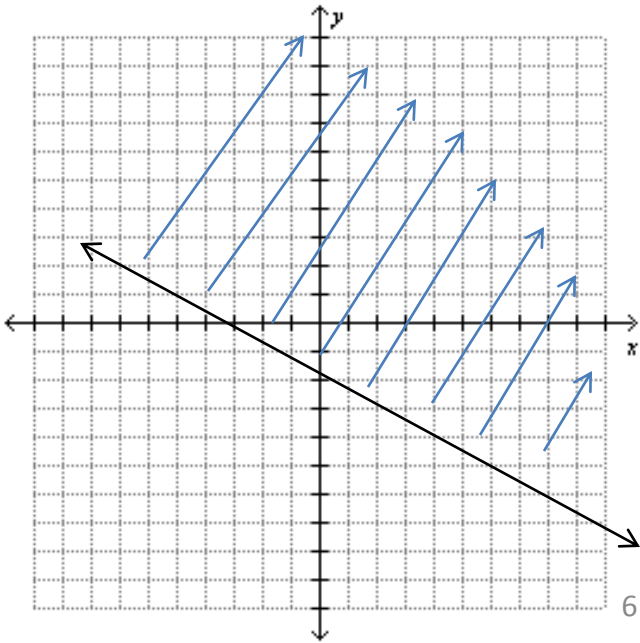


What is up or down?
Put your ruler end on the line. If the ruler points to the top of the paper, that is up. If it points to the bottom of the paper, it is down.

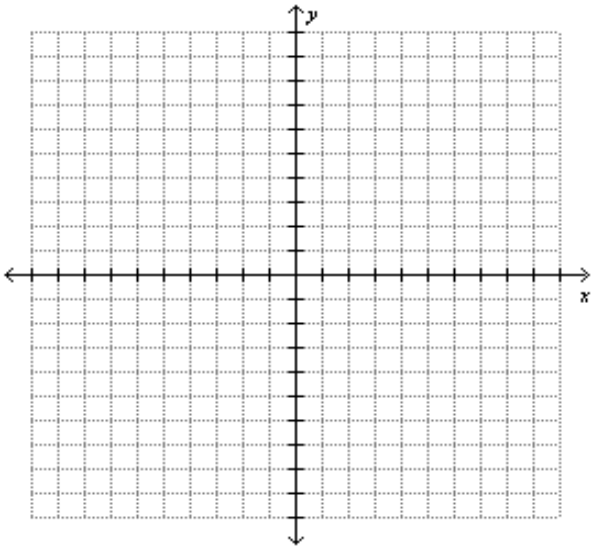
Solutions? Any point in the shaded area!!! If it is a solid line, also any point on the line (dotted line, those points don't count!!!!

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

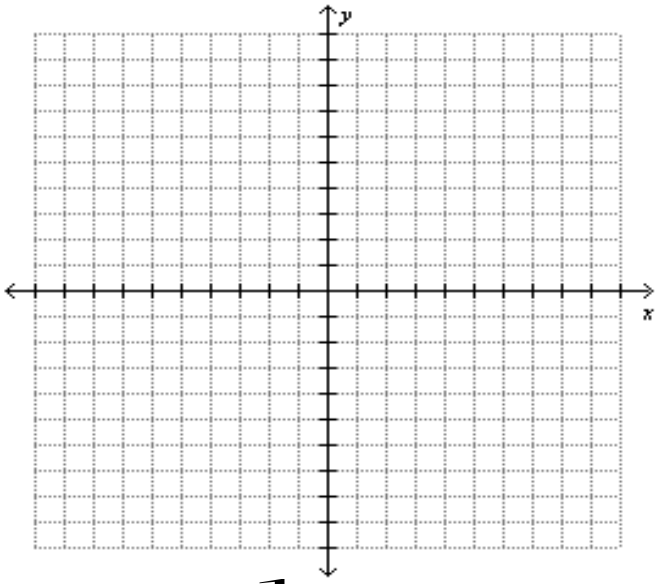
Slope = -1/2	Y intercept = -2
equal sign…solid line	Greater than shade up



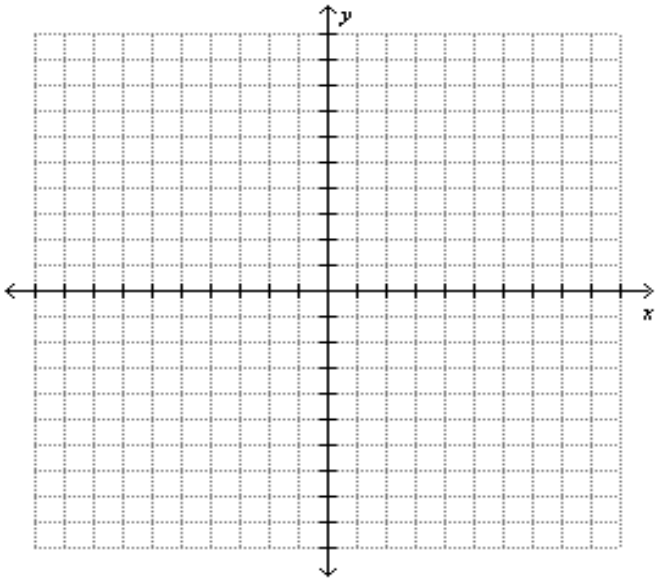
Graph the following Inequalities



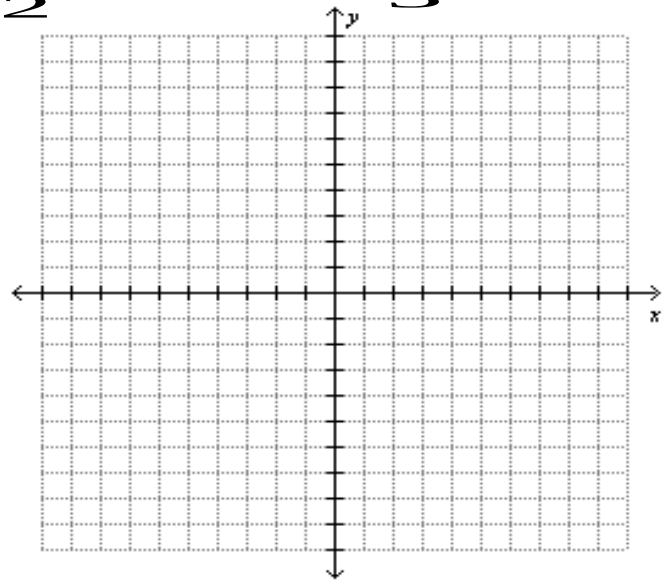
$y \leq -3x + 2$



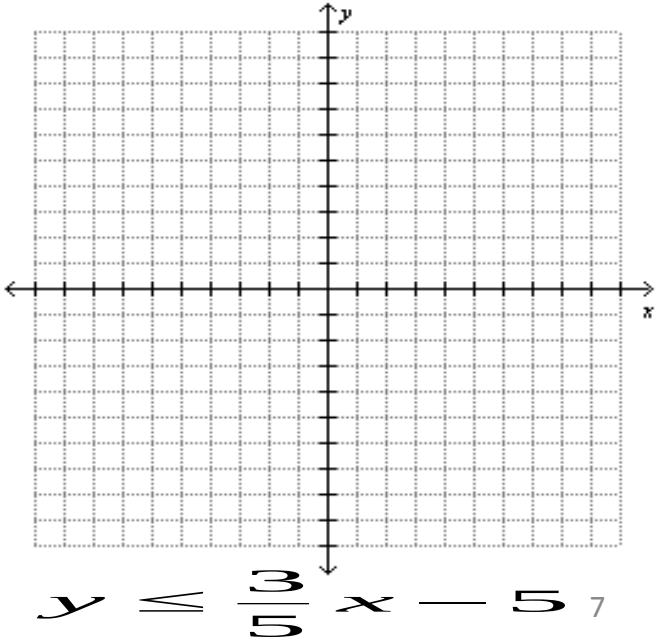
$y = \frac{1}{3}x - 2$



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



$y > 3x + 4$



$y \leq \frac{3}{5}x - 5$

Did you shade the correct direction?
Use (0,0). If that MAKES THE INEQUALITY TRUE, (0,0) SHOULD BE IN THE SHADED DIRECTION. If not, then (0,0) should not be in the shaded area!!!!
Name

_____
Class period_____

Graphing Systems of Inequalities. Inequalities of the y > mx +b form DUE EXAM DAY

- Graphing a system of inequalities in y+ form is not that different than graphing a system of equations of the y=mx+b form. First you locate both lines of the graph as if it were y = mx +b, then you get fancy with it. Remember open circles were used when there was no = sign in your equality? Well, now you use a dotted (dashed) line with open spaces between the dashes. AS solid line means it has an = sign also. Then you have to "shade" up for greater than, down for less than. Examples:

Y < 3 x + 2 and y > ½ x -3

Slope = 3/1	Y intercept = 2
No equal sign…dotted line	Less than shade down

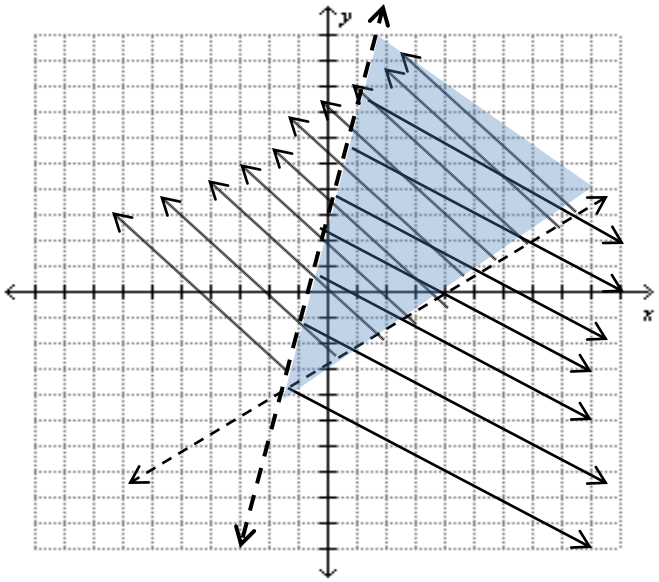
Slope = 1/2	Y intercept = -3
dotted	Shade up

The solutions are the points where the two shaded areas meet (remember dotted lines not included, solid lines included)

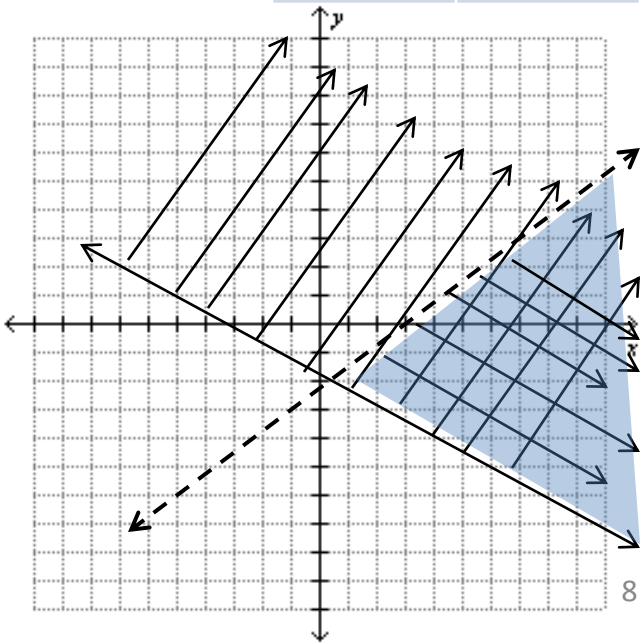
$$y \geq -\frac{1}{2}x - 2$$
$$y < 2x - 2$$

slope = - ½	Y intercept = -2
equal sign…solid line	Greater than shade up

Slope = 2/1	YI = -2
dotted	SHADE DOWN



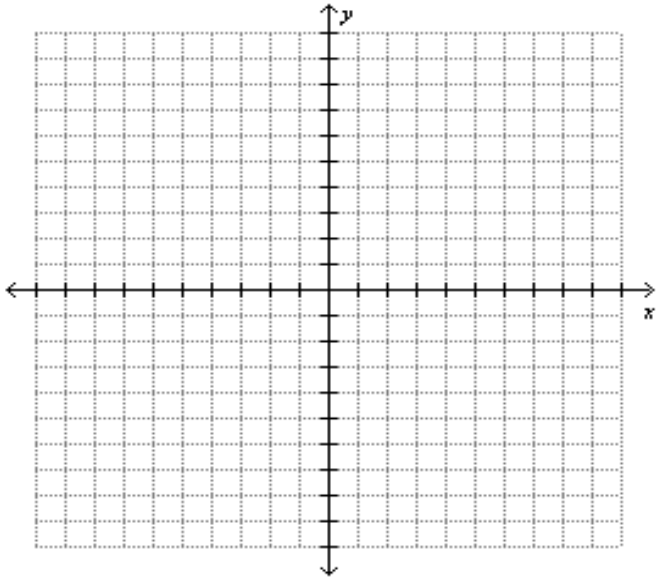
Quick trick to test your graph.
Use (0,0)
Put in both equations. <u>If both are true</u>, then (0,0) is in solution area, if not it should be outside.
Right example 0< 0+2 True
0> 0 -3 True (0,0) IS IN solution area.
Left example 0> 0- ½ True
0 < 0-2 False (0,0) is not in the solution set.



Graph the following System of Inequalities

Name _____

Period _____

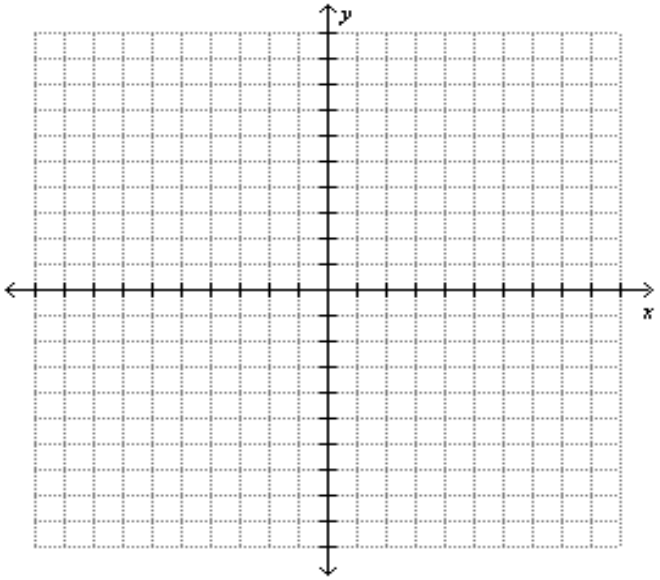


$$y \leq \frac{3}{4}x + 1$$

$$y > -3x - 2$$

$$y \leq 2x - 3$$

$$y \geq 2x + 2$$



$$y < 4$$

$$y \geq 2x - 2$$