

Chapter 6

Review

**Systems of Linear
Equations and Inequalities**

_____ is a method for solving a systems of equations in which you multiply one or both equations by a non-zero number to get a variable term with coefficients that have a sum of zero

Linear combination or elimination

_____ is a method for solving a system of linear equations in which at least one equation must be solved for a single variable.

Substitution

Is $(2,5)$ a solution for:

$$y = 2x + 1 \text{ and}$$

$$2x - y = 1?$$

No, does not work in
2nd equation

How many solutions does this system of equations have?

$$y = -1/2x + 2 \text{ and}$$

$$3x + 6y = 12$$

Infinitely many – they
are the same line

Which method(s) of solution for the
system

$$y = 3x - 1 \text{ and } y = -x + 3$$

is directly applicable?

Graphing AND Substitution –
they are both in slope-
intercept form

Which method(s) of solution for
the system

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

is directly applicable?

Substitution – the first
equation is solved for y

Which method of solution for the
system

$$3x + y = -1 \text{ and } x - y = -3$$

is directly applicable?

Linear combination/elimination –
adding the two equations together
would eliminate the “y’s”

Solve this system of equations using
any method:

$$y = 3x - 1 \text{ and } y = -x + 3$$

(1,2)

Solve this system of equations
using any method:

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

No solution; parallel lines

Solve this system of equations
using any method:

$$3x + y = -1 \text{ and } x - y = -3$$

$(-1, 2)$

Solve this system of equations using any method:

$$2x + y = 1 \text{ and}$$

$$x = -1/2y + 1/2$$

Infinite solutions; same line

There are 24 problems on a test. Each problem is worth 4 or 5 points each, for a total of 100 points. Write a system of equations to determine how many of each problem were on the test.

$$x + y = 24 \quad \text{and} \quad 4x + 5y = 100$$

OR

$$x + y = 24 \quad \text{and} \quad 5x + 4y = 100$$

A chemist need 34 L of a 30% solution of acid. He mixes two solutions, one a 50% solution and one a 25% solution. Write a system of equations to determine how much of each solution he will need.

$$x + y = 34 \text{ and } .5x + .25y = 10.2$$

$$(50x + 25y = 1020)$$

OR

$$x + y = 34 \text{ and } .25x + .5y = 10.2$$

$$(25x + 50y = 1020)$$

An airplane flew 6 hours to St. Louis and 8 hours on the return trip. If the trip was 800 miles long, write a system of equations to model this information.

$$6(x+y) = 800 \text{ and } 8(x-y) = 800$$

Which ordered pair is a solution of the system:

$$6x - 6y = 2 \text{ and } 3x + 9y = -7$$

- a) $(2/3, -1/3)$
- b) $(-2/3, 1/3)$
- c) $(1/3, 2/3)$
- d) $(-1/3, -2/3)$
- e) None of the above

D

$(-1/3, -2/3)$

Which value of “b” will make the graphs of:

$y = 2x + 3$ and $y = 2.5x + b$ intersect at $(2, 7)$?

a) 2

b) 3

c) 5

d) 7

e) None of the above

A

2

The first equation in a system of equations is:

$x - 2y = 10$. There is no solution to the system.

Which equation is a possible second equation.

a) $2y - x = 6$

b) $y = \frac{1}{2}x - 4$

c) $2y = x$

d) None of the above

e) All of the above

E

All of the above; all have same
slope as original equation

Here are two ads for jobs:

\$150/wk + 20% commission on sales

\$200/wk + 10% commission on sales

At what amount of sales will the two jobs pay the same amount?

\$500.00

Use the solution of

$$4x - 2y = 11 \text{ and}$$

$$3x - 4y = -6$$

to find $x - y$

-0.1

Which system of equations **does not** have the same solution as:

$$7x - 4y = 5 \text{ and } 6x + 7y = -11?$$

- a) $49x - 28y = 35$ and $24x + 28y = -44$
- b) $-14x + 8y = -10$ and $12x + 14y = -22$
- c) $42x - 24y = 30$ and $42x + 49y = -77$
- d) $21x + 12y = 15$ and $-24x - 28y = 44$
- e) None of the above

D

$$21x + 12y = 15 \text{ and } -24x - 28y = 44$$

Find the area of a trapezoid formed with lines:

$$2x + 4y = 16$$

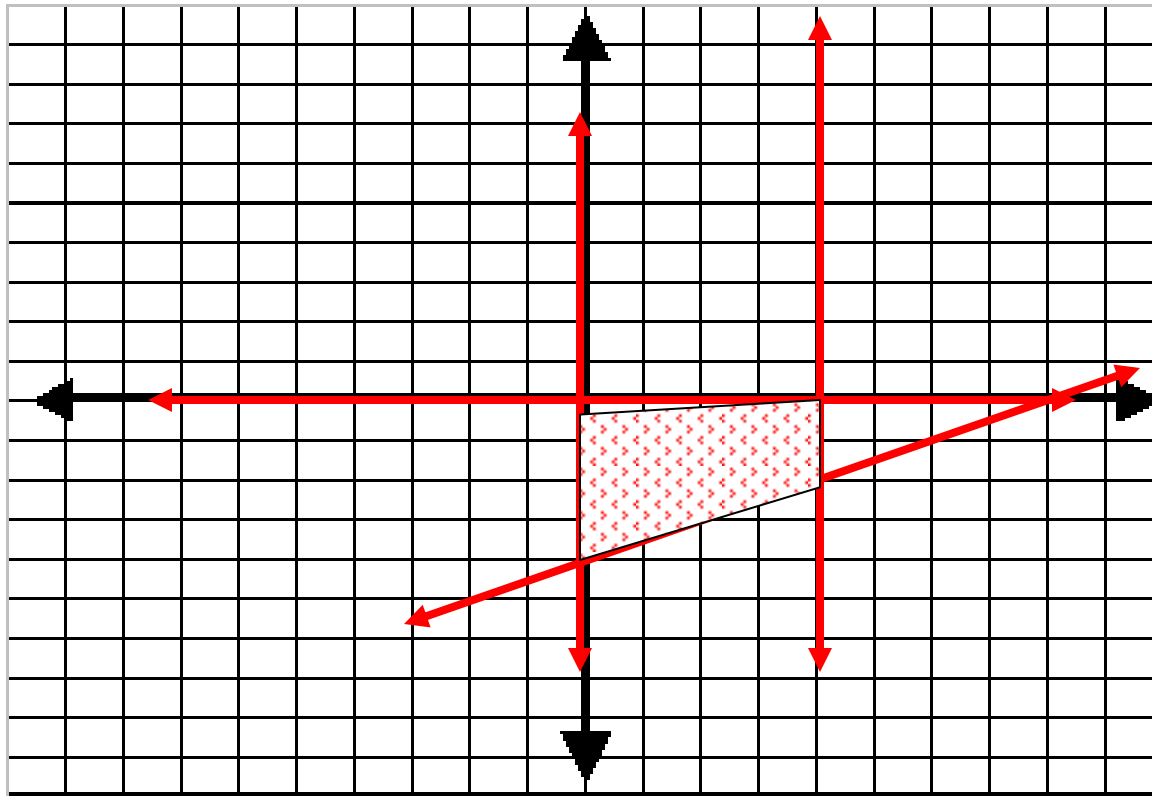
$$x = 4$$

$$x = 0$$

$$y = 0$$

$$\text{Area of trapezoid} = \frac{1}{2} * \text{height} * (\text{sum of bases})$$

$$12 = \frac{1}{2} * 4(4 + 2)$$

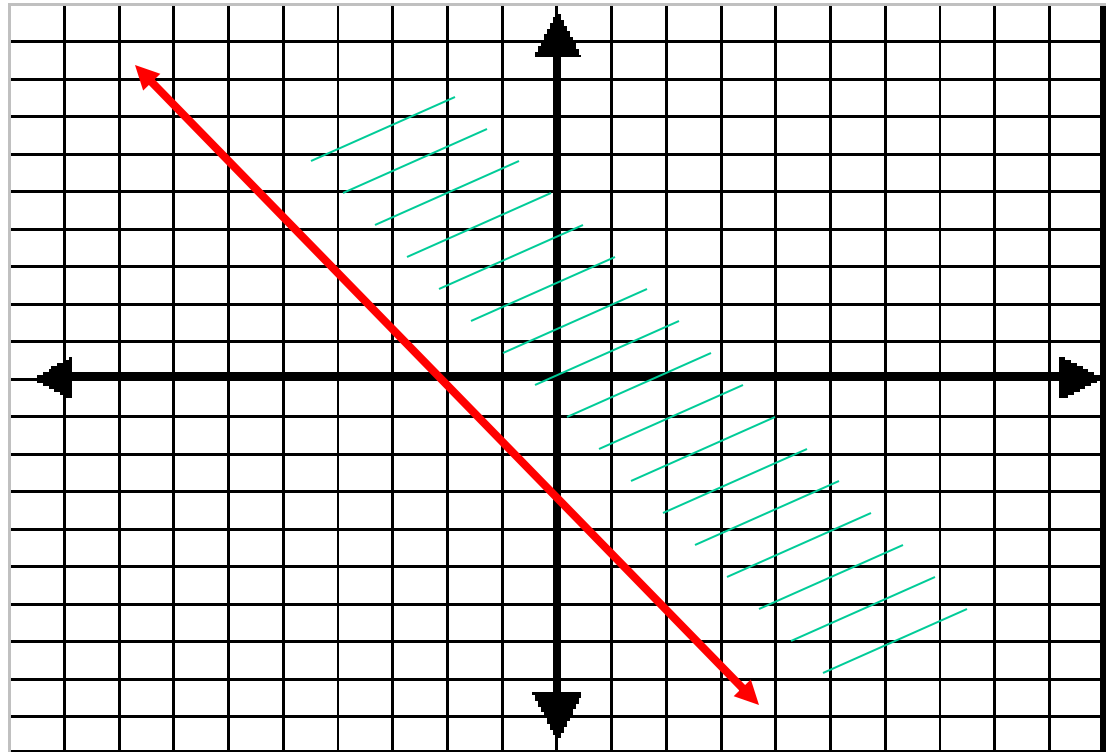


Write a system of equations which describes:

The sum of 2 numbers is 20. The difference between three times the larger and twice the smaller is 40.

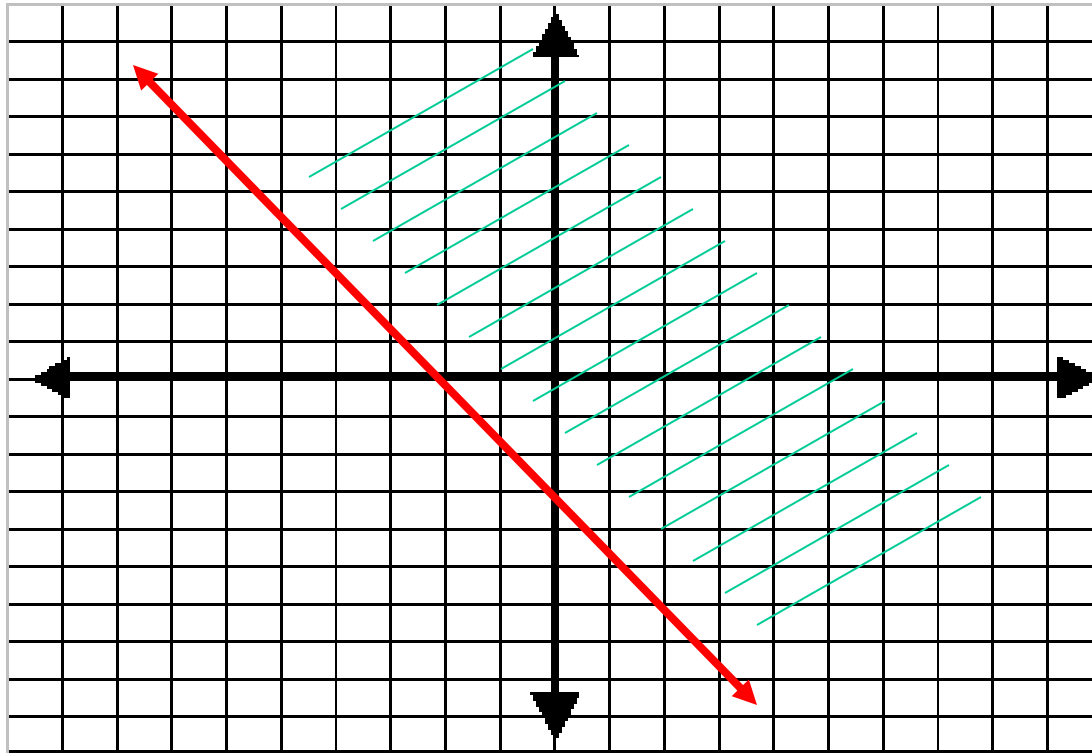
$$x + y = 20 \text{ and } 3x - 2y = 40$$

Name the linear inequality shown

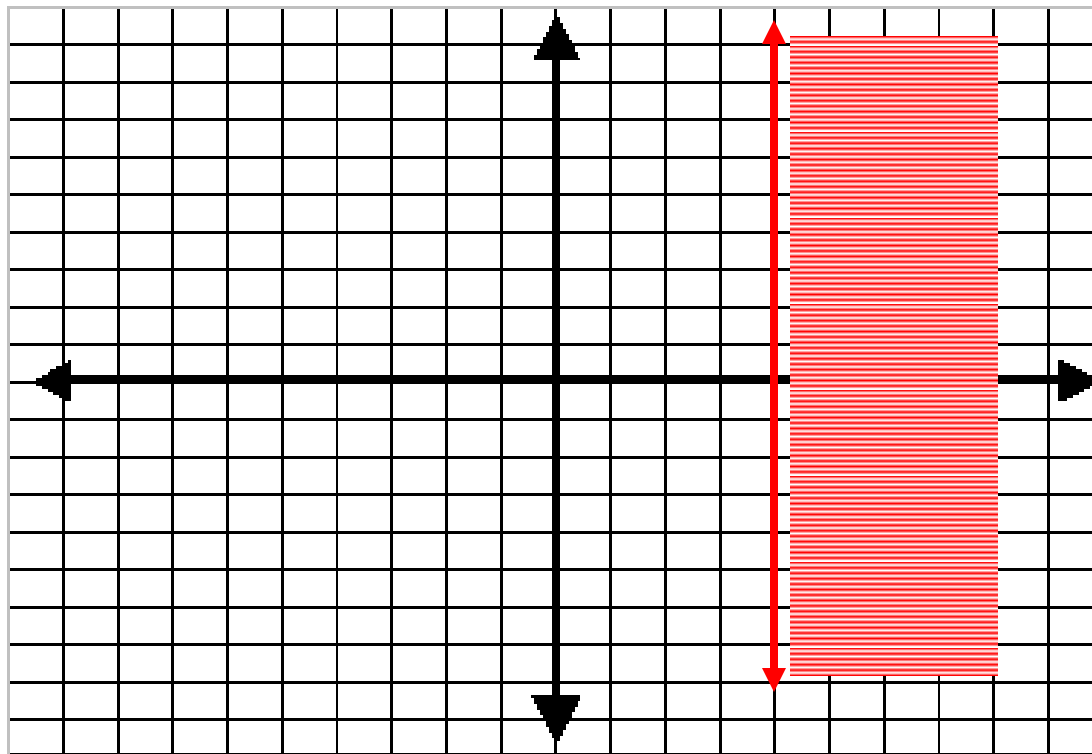


$$2x + 3y \geq -6$$

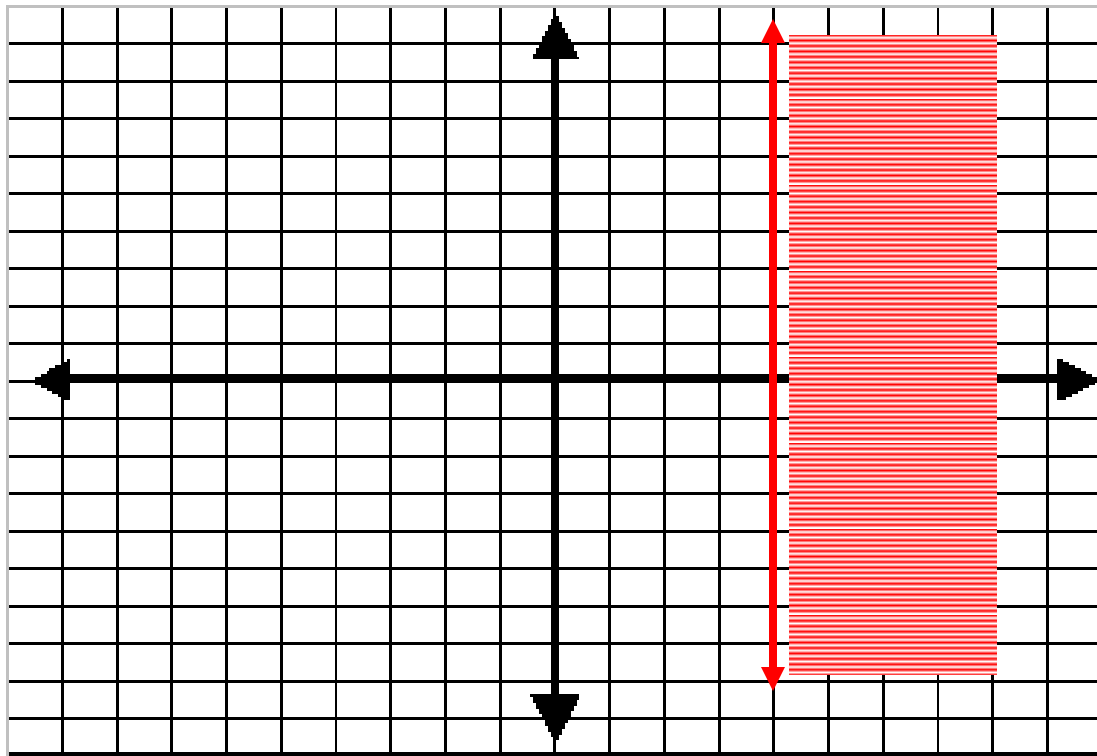
$$Y \geq -\frac{3}{2}x - 3$$



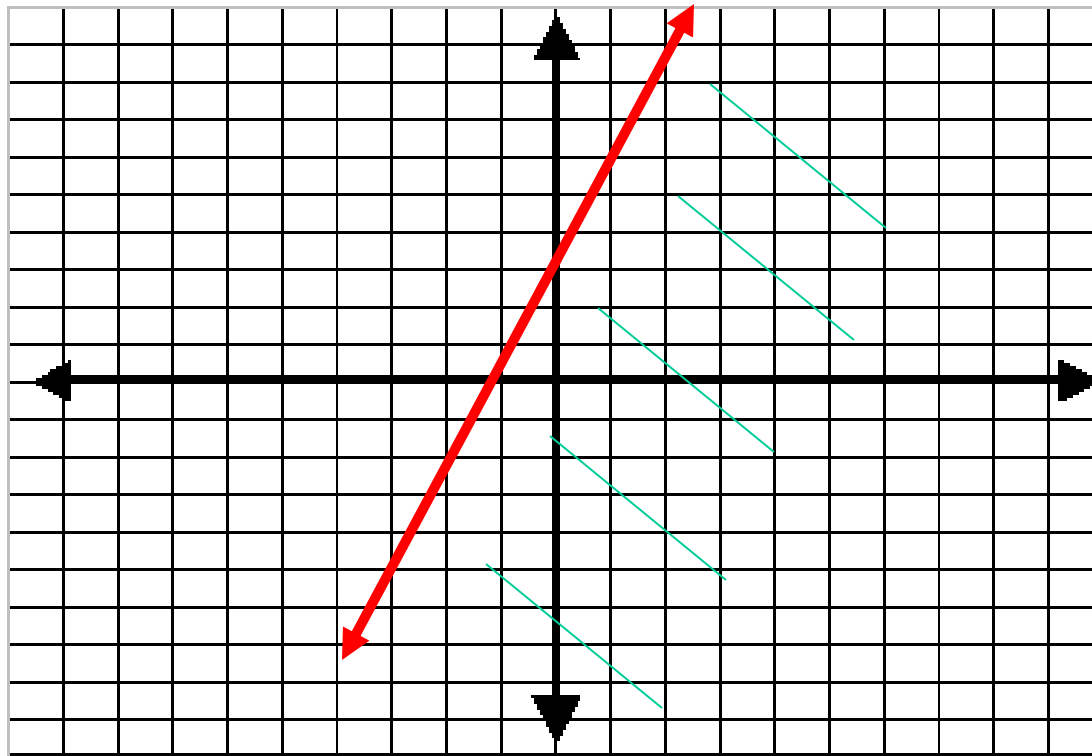
Name the linear inequality shown



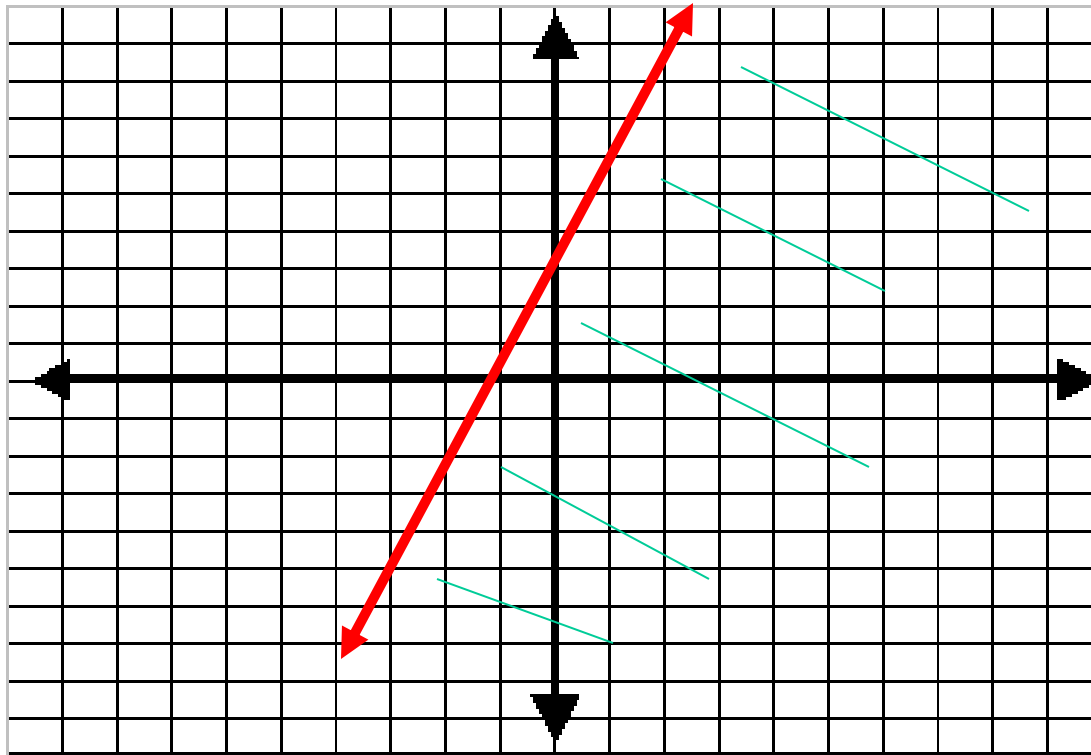
$$X \geq 4$$



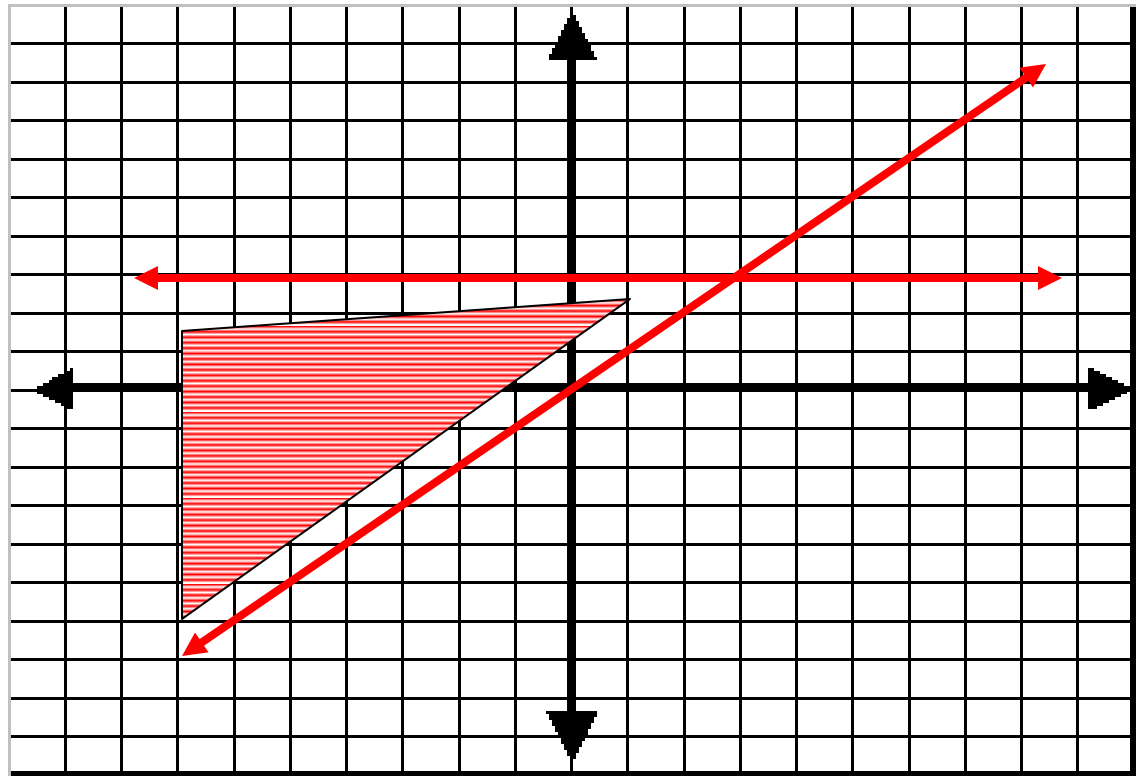
Name the linear inequality shown



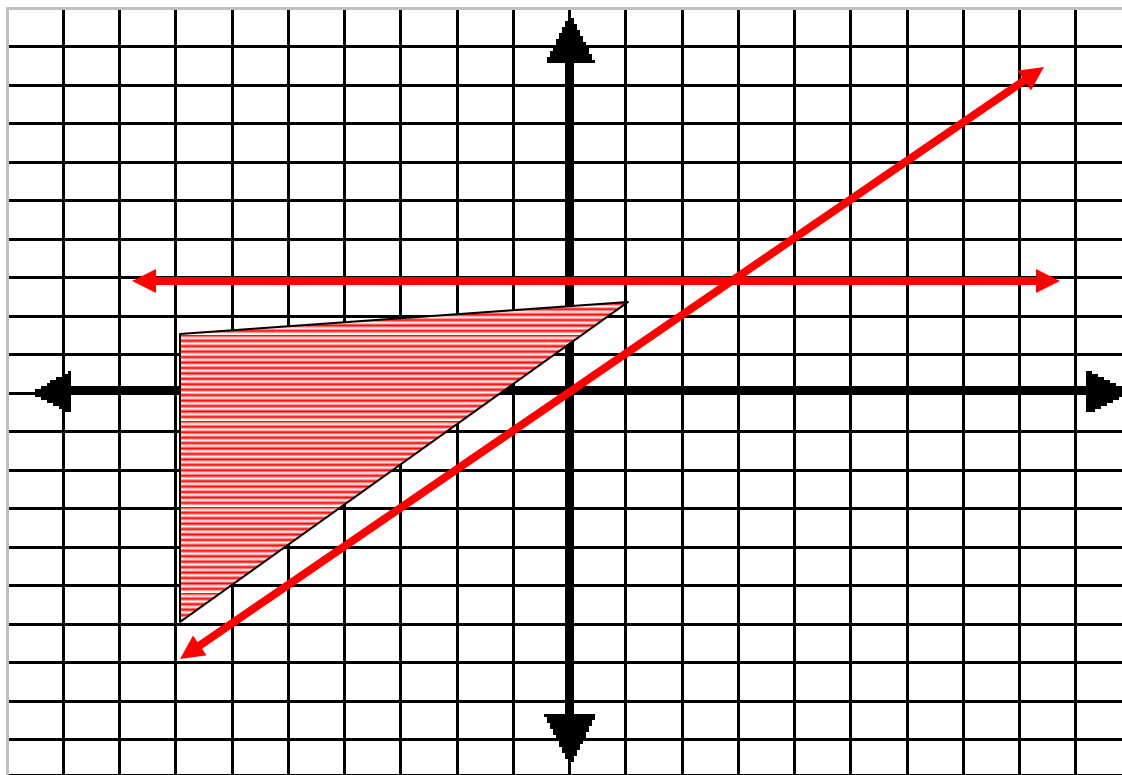
$$y \leq 3x + 3$$



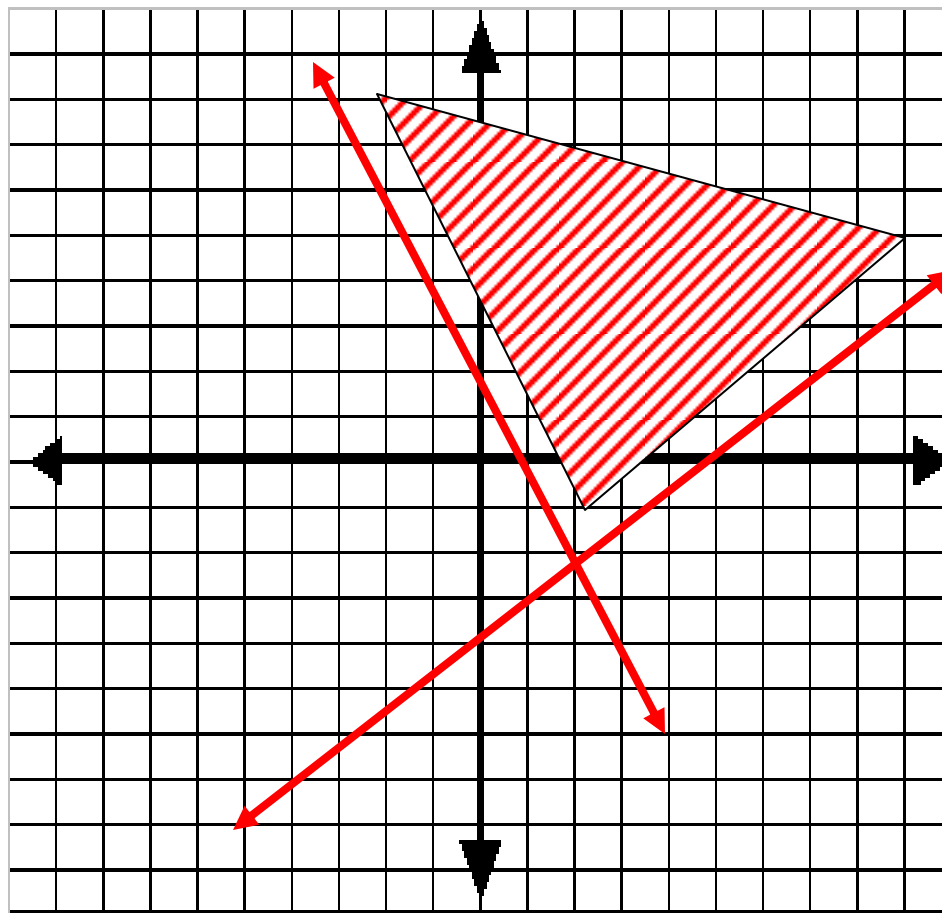
Name the system of linear inequalities shown.



$$y \leq 3 \text{ and } y \geq x$$



Name the system of linear inequalities shown.



$$y \geq -2x + 2 \text{ and } y \geq \frac{4}{5}x - 4$$

