

6.5/7.6: Graphing Linear Inequalities Examples

Example 1: Check whether the ordered pair is a solution of $2x - 3y \geq -2$

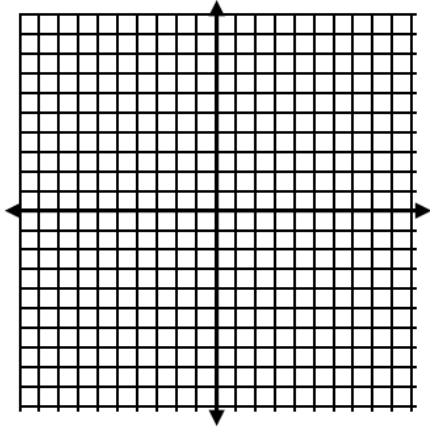
a. (0,0)

b. (0,1)

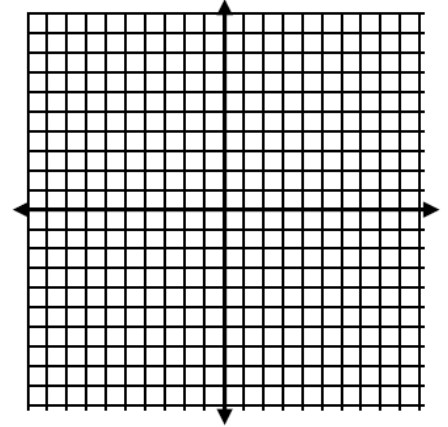
c. (2,-1)

Example 2: Sketch the graph of the linear inequality

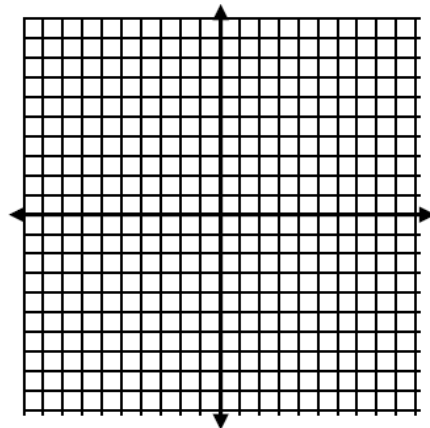
1) $y > -x + 3$



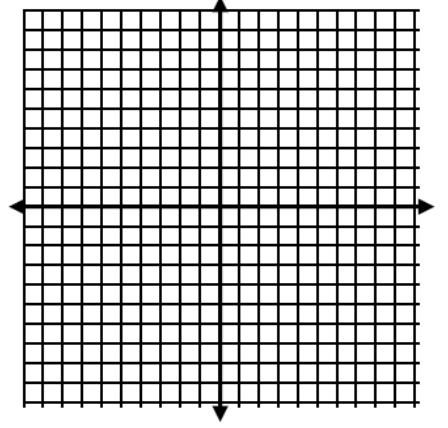
2) $x > -3$



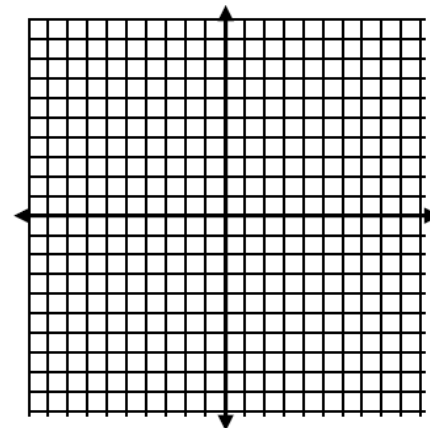
3) $y \leq 4$



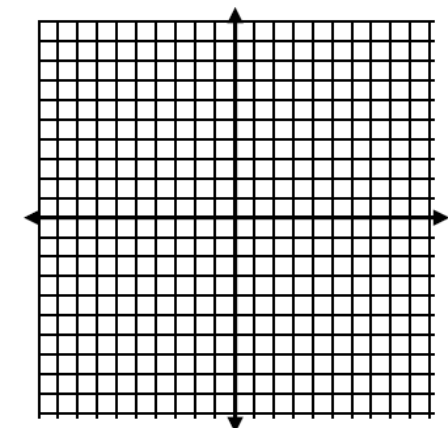
4) $y - 5x < 0$



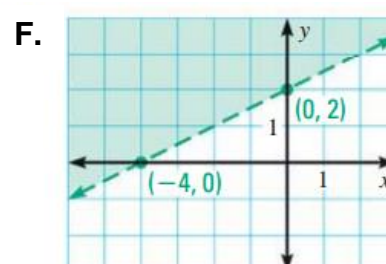
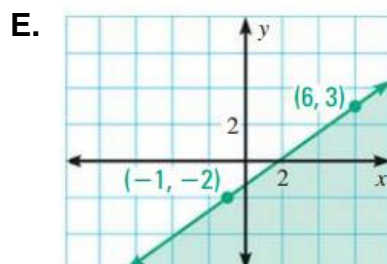
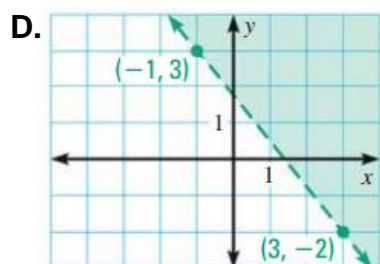
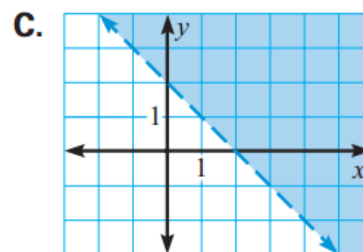
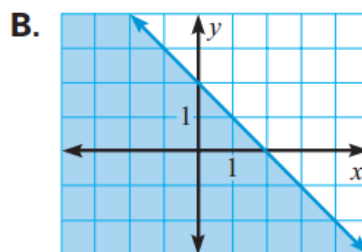
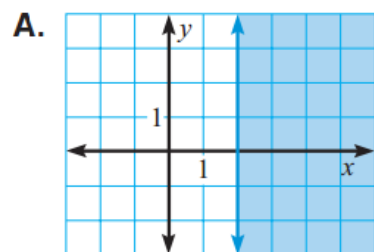
5) $9x - 3y \geq 18$



6) $x - y \leq 2$




Example 3: Write an inequality whose solution is shown in the graph.




Example 4: Write and solve an inequality for the given situation.

PROBLEM #1

 **CAR SALES** You are a car dealer. You have \$1,408,000 available to purchase compact cars and sport utility vehicles for your lot. The compact car costs \$11,000 and the sport utility vehicle costs \$22,000. Let x represent the number of compact cars and let y represent the number of sport utility vehicles you purchase. Write an inequality that models the different numbers of compact cars and sport utility vehicles that you could purchase.

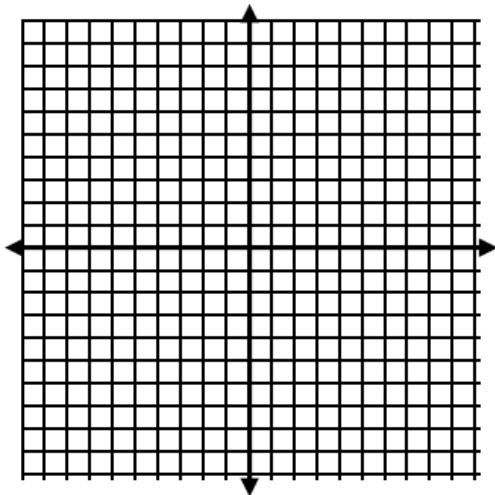
PROBLEM #2

 **FOOTBALL** In the last quarter of a high school football game, your team is behind by 21 points. A field goal is 3 points and a touchdown (with the point-after-touchdown) is 7 points. Let x represent the number of field goals scored. Let y represent the number of touchdowns scored.

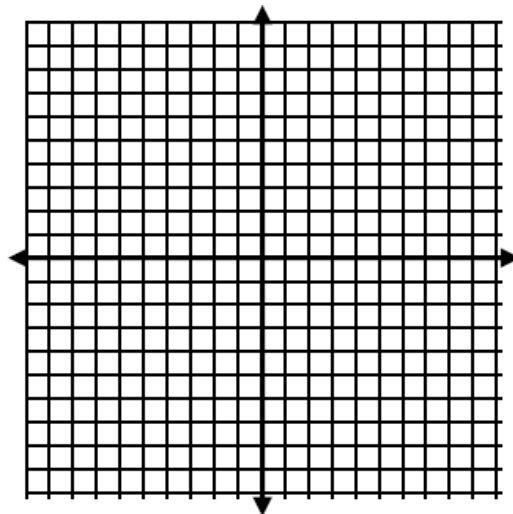
- a. Write and graph an inequality that models the different numbers of field goals and touchdowns your team could score and still not win or tie. (Assume the other team scores no more points.)
- b. Does every point on the graph represent a solution of the real-life problem? Give examples to support your answer.

Example 5: Solve the system of inequalities by graphing

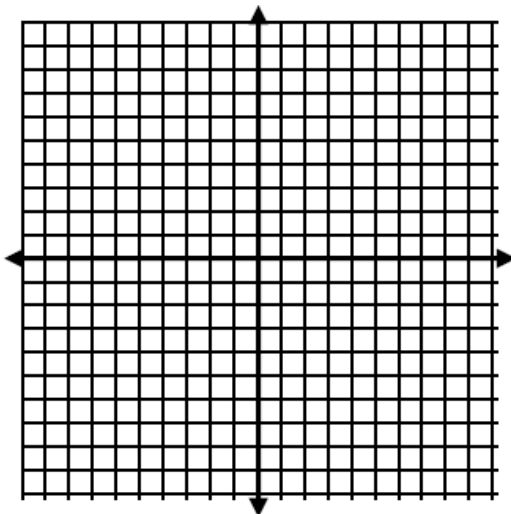
7)
$$\begin{cases} 2x + y \geq -4 \\ x - 2y < 4 \end{cases}$$



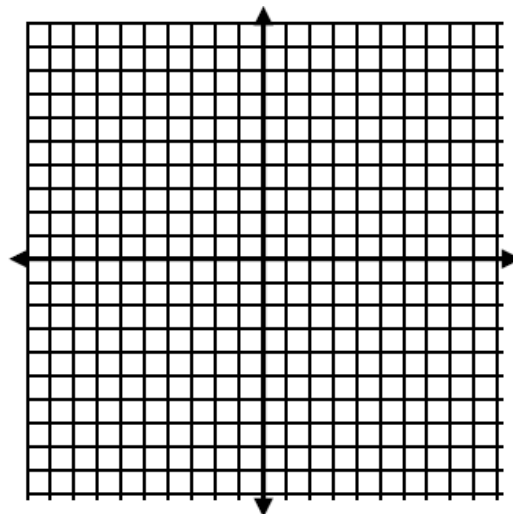
8)
$$\begin{cases} y \leq -x + 6 \\ x \geq 1 \\ y > -2 \end{cases}$$



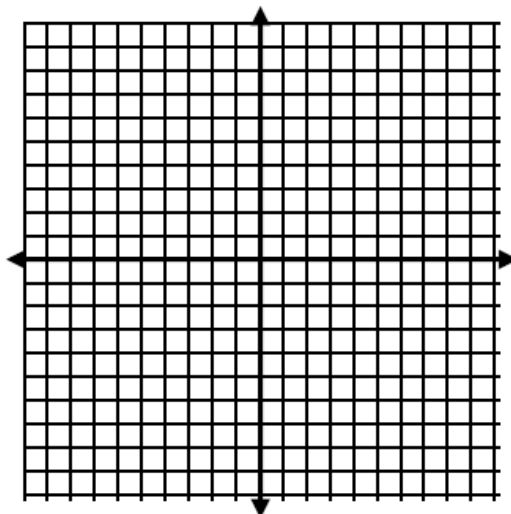
9)
$$\begin{cases} x > -2 \\ y \geq -2 \\ x \leq 1 \end{cases}$$



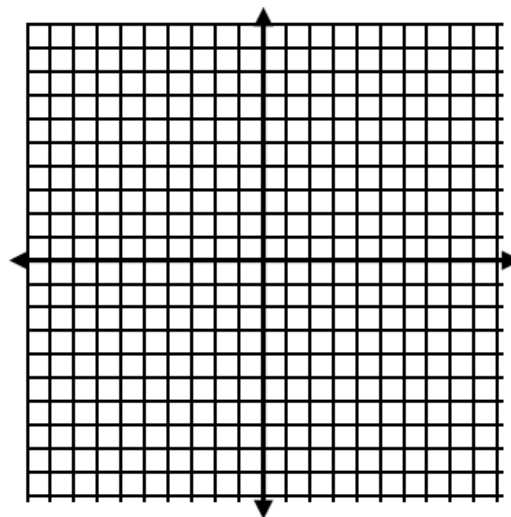
10)
$$\begin{cases} y < 3 \\ x \geq 2 \\ y > x - 3 \end{cases}$$



11)
$$\begin{cases} y \geq x - 2 \\ y < x + 1 \end{cases}$$



12)
$$\begin{cases} x \geq 0 \\ -x + 3y \leq 6 \\ y > x \end{cases}$$



Example 6: Write and solve a system of inequalities to solve the situation

PROBLEM #1

ACTUAL KEYSTONE PROBLEM

Tyreke always leaves a tip of between 8% and 20% for the server when he pays for his dinner. This can be represented by the system of inequalities shown below, where y is the amount of tip and x is the cost of dinner.

$$\begin{aligned} y &> 0.08x \\ y &< 0.2x \end{aligned}$$

Which of the following is a true statement?

- A. When the cost of dinner (x) is \$10, the amount of tip (y) must be between \$2 and \$8.
- B. When the cost of dinner (x) is \$15, the amount of tip (y) must be between \$1.20 and \$3.00.
- C. When the amount of tip (y) is \$3, the cost of dinner (x) must be between \$11 and \$23.
- D. When the amount of tip (y) is \$2.40, the cost of dinner (x) must be between \$3 and \$6.

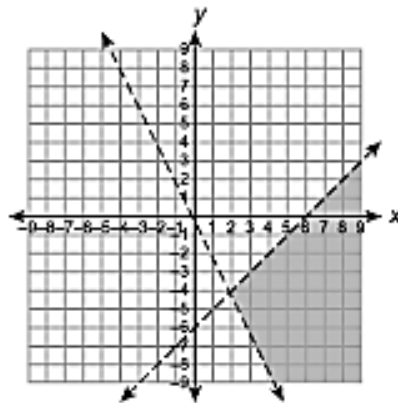
PROBLEM #2

ACTUAL KEYSTONE PROBLEM

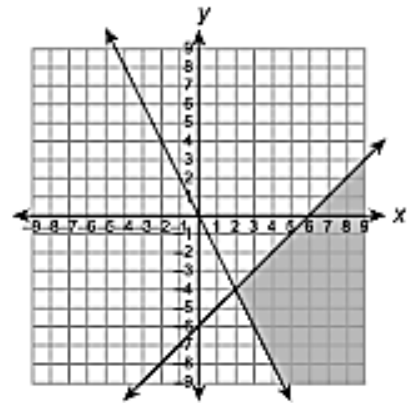
A system of inequalities is shown: $y < x - 6$
 $y > -2x$

Which graph shows the solution set of the system of inequalities?

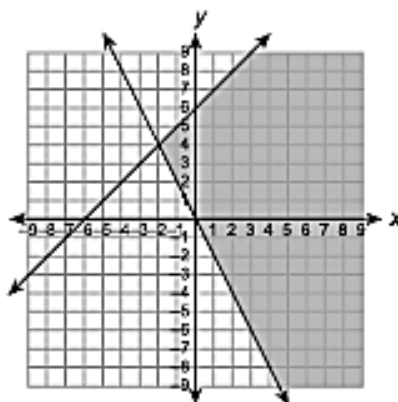
A.



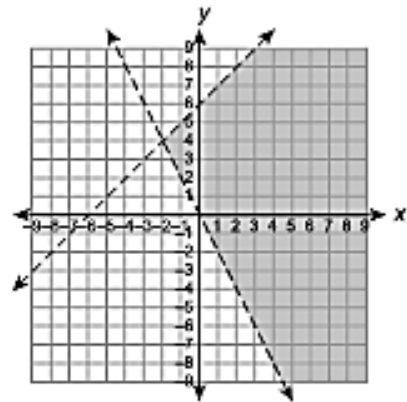
B.



C.



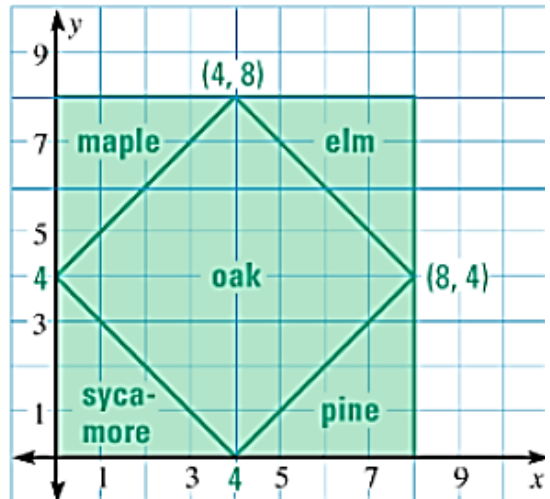
D.



PROBLEM #3

MULTI-STEP PROBLEM Use the tree farm shown at the right.

- a. Write a system of inequalities that defines the region containing maple trees.
- b. Write a system of inequalities that defines the region containing sycamore trees.
- c. Write a system of inequalities that defines the region containing oak trees.



- d. Calculate the area of the oak tree region. Explain your method.

Textbook Pages:

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Homework:

Example 1: p. 363 #15 – 22

Example 2: p. 363 – 364 #23 – 60

Example 3: p. 364 # 61 – 63

Example 4: p. 364 – 365 #64 – 66

Example 5: p. 435 – 436 #9 – 26

Example 6: p. 436 #34 – 36