Name: _____ **Class:** _____ **Date:** _____ **ID: A**

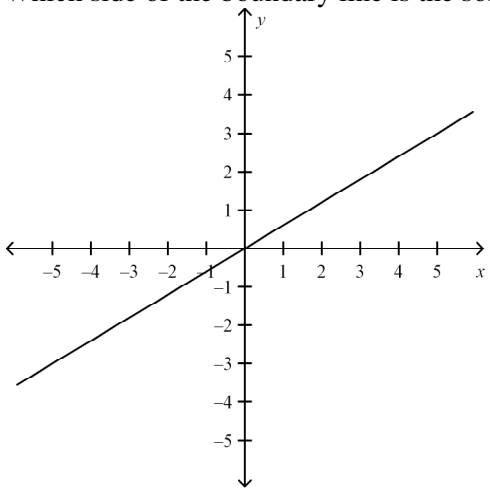
Inequality Review

Short Answer

1. Is the point (0, 0) in the solution set for the linear inequality $4y - 2x \leq 0$?

2. Is the point (–2, 2) in the solution set for the linear inequality $4y - 2x \leq 0$?

3. Which side of the boundary line is the solution set for the linear inequality $5y + 3x \leq 0$?



4. Graph the solution set for the linear inequality $x + y \geq 1$.

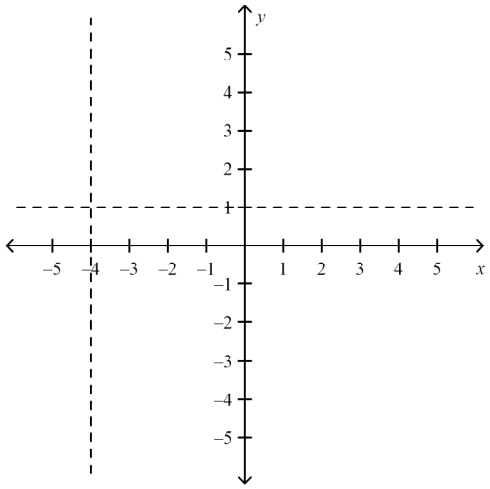
5. Graph the solution set for the linear inequality $5y - 2x \leq 15$.

6. Graph the system of linear inequalities:
$\{(x, y) \mid x + y \leq 2, x > -3, x \in \mathrm{R}, y \in \mathrm{R}\}$

7. Is the point (–50, 0) in the solution set for the following system of linear inequalities?
$\{2y - 2x \geq 25, y > 2x + 10, x \in \mathrm{I}, y \in \mathrm{I}\}$

8. Determine two valid solutions for the following system of linear inequalities.
$\{3y - 8x \leq 0, y > 2, x > 5, x \in \mathrm{I}, y \in \mathrm{I}\}$

9. Complete the graph of the solution set for the following system of inequalities.
$\{(x, y) \mid y < 1, x > -4\}$



10. A student council is ordering signs for the winter dance. Signs can be made in letter size or poster size.
- No more than 30 of each size are wanted.
- No more than 50 signs are needed altogether.
- Letter-size signs cost $8.75 each, and poster-size signs cost $14.50 each.

Let l represent the number of letter-size signs.
Let p represent the number of poster-size signs.
Write the objective function to determine the combination of the two sizes of signs that would result in the lowest cost to the council.

11. Baskets of fruit are being prepared to sell.
- Each basket contains at least 8 apples and more than 4 oranges.
- Apples cost 25¢ each, and oranges cost 40¢ each.
- The budget allows no more than $6, in total, for the fruit in each basket.

Let x represent the number of apples.
Let y represent the number of oranges.
Write a linear inequality to represent the cost of each basket (in dollars).

12. A system of linear inequalities has vertices at (2, 4), (–2, 5), and (0, 0).
Which point represent the maximum value of the objective function $Z = 4y + \frac{1}{2}x$?

13. The following model represents an optimization problem. Determine the maximum solution.
Restrictions:
$x \in \mathrm{I}$
$y \in \mathrm{I}$

Constraints:
$x \geq 0$
$y \geq 0$
$2x + y \geq 10$
$x + y \leq 20$

Objective function:
$J = -10(x + y)$

Inequality Review
Answer Section

SHORT ANSWER

1. ANS:
yes

PTS: 1 DIF: Grade 11 REF: Lesson 6.1
OBJ: 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line. TOP: Graphing linear inequalities in two variables
KEY: linear inequality | solution set

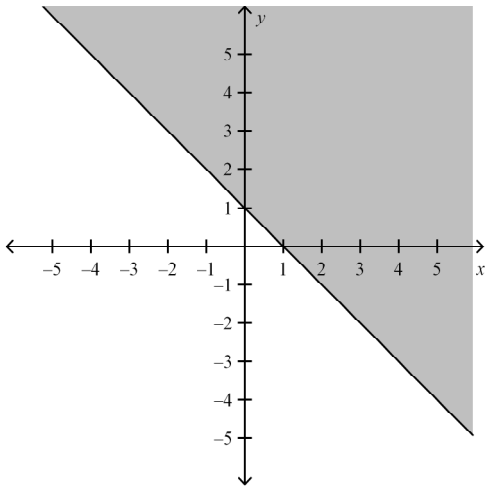
2. ANS:
no

PTS: 1 DIF: Grade 11 REF: Lesson 6.1
OBJ: 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line. TOP: Graphing linear inequalities in two variables
KEY: linear inequality | solution set

3. ANS:
below the line

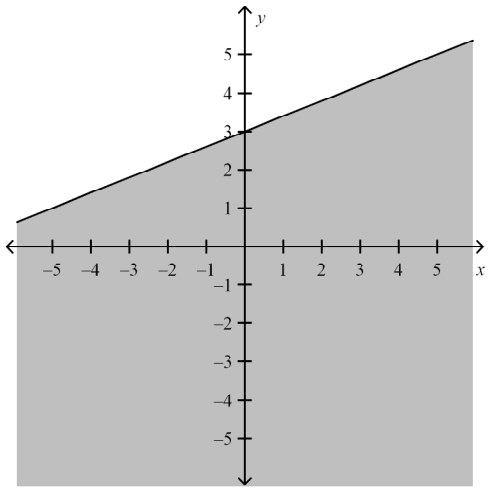
PTS: 1 DIF: Grade 11 REF: Lesson 6.1
OBJ: 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line. TOP: Graphing linear inequalities in two variables
KEY: linear inequality | solution set

4. ANS:



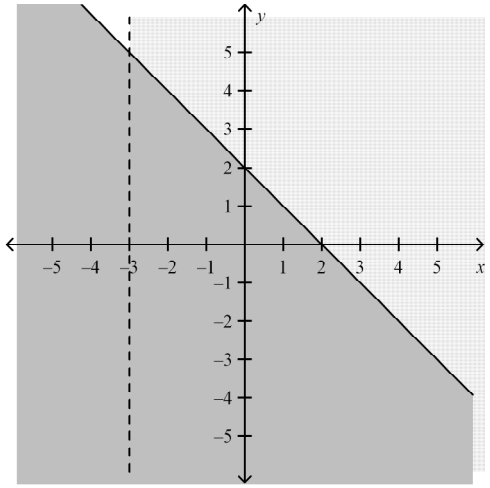
PTS: 1 DIF: Grade 11 REF: Lesson 6.1
OBJ: 1.2 Graph the boundary line between two half planes for each inequality in a system of linear inequalities, and justify the choice of solid or dashed lines. | 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line.
TOP: Graphing linear inequalities in two variables KEY: linear inequality | solution set

5. ANS:



PTS: 1 DIF: Grade 11 REF: Lesson 6.1
OBJ: 1.2 Graph the boundary line between two half planes for each inequality in a system of linear inequalities, and justify the choice of solid or dashed lines. | 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line.
TOP: Graphing linear inequalities in two variables KEY: linear inequality | solution set

6. ANS:



PTS: 1 DIF: Grade 11 REF: Lesson 6.2
OBJ: 1.4 Determine, graphically, the solution region for a system of linear inequalities, and verify the solution. | 1.5 Explain, using examples, the significance of the shaded region in the graphical solution of a system of linear inequalities. TOP: Exploring graphs of systems of linear inequalities
KEY: systems of linear inequalities

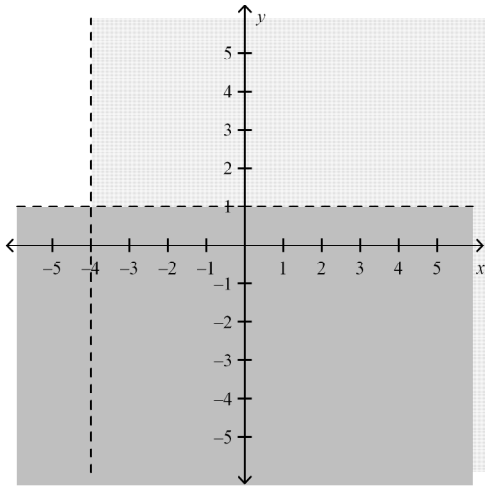
7. ANS:
no

PTS: 1 DIF: Grade 11 REF: Lesson 6.3
OBJ: 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line. TOP: Graphing to solve systems of linear inequalities
KEY: systems of linear inequalities | solution set

8. ANS:
e.g., (10, 3) and (20, 5)

PTS: 1 DIF: Grade 11 REF: Lesson 6.3
OBJ: 1.2 Graph the boundary line between two half planes for each inequality in a system of linear inequalities, and justify the choice of solid or dashed lines. | 1.4 Determine, graphically, the solution region for a system of linear inequalities, and verify the solution. | 1.5 Explain, using examples, the significance of the shaded region in the graphical solution of a system of linear inequalities.
TOP: Graphing to solve systems of linear inequalities KEY: systems of linear inequalities

9. ANS:



PTS: 1 DIF: Grade 11 REF: Lesson 6.3
OBJ: 1.3 Determine and explain the solution region that satisfies a linear inequality, using a test point when given a boundary line. | 1.4 Determine, graphically, the solution region for a system of linear inequalities, and verify the solution. | 1.5 Explain, using examples, the significance of the shaded region in the graphical solution of a system of linear inequalities. TOP: Graphing to solve systems of linear inequalities
KEY: systems of linear inequalities | solution set

10. ANS:
$C = 8.75l + 14.50p$

PTS: 1 DIF: Grade 11 REF: Lesson 6.4
OBJ: 1.1 Model a problem, using a system of linear inequalities in two variables.
TOP: Optimization problems II: exploring solutions
KEY: optimization problem | objective function

11. ANS:
$0.25x + 0.40y \leq 6$

PTS: 1 DIF: Grade 11 REF: Lesson 6.4
OBJ: 1.1 Model a problem, using a system of linear inequalities in two variables.
TOP: Optimization problems II: exploring solutions KEY: optimization problem | constraint

12. ANS:
(–2, 5)

PTS: 1 DIF: Grade 11 REF: Lesson 6.5
OBJ: 1.4 Determine, graphically, the solution region for a system of linear inequalities, and verify the solution. TOP: Optimization problems II: exploring solutions
KEY: optimization problem | systems of linear inequalities | objective function

13. ANS:
(5, 0)

PTS: 1 DIF: Grade 11 REF: Lesson 6.6
OBJ: 1.6 Solve an optimization problem, using linear programming.
TOP: Optimization problems III: linear programming
KEY: optimization problem | linear programming | systems of linear inequalities | objective function