

NAME: _____ Score _____ /100
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

2 points each for questions 1 – 25. 5 points each for questions 27 – 34. 10 pts for question 26.

Circle T or F, whichever is correct.

1. T F The graph of a linear inequality in two variables is a line.
2. T F The graph of an inequality of the form $|mx + b| < k$ is an interval on the number line.
3. T F The graph of an inequality of the form $|mx + b| > k$ is an interval on the number line.
4. T F The graph of an equality of the form $|mx + b| = k$ is an interval on the number line.
5. T F The graph of $y = 43$ (when considered in the plane) is a horizontal line.
6. T F The solution set for the equation $13x + 29y = 17$ is a set of ordered pairs of numbers.
7. T F The solution set for the equation $13x + 29y = 17$ is a set of numbers.
8. T F The graph of $13x + 29y < 17$ is a half-plane containing the origin.
9. T F A horizontal line has no slope.
10. T F The solution set for $|3x - 5| > -1$ is \emptyset .

Fill in each of the blanks to make the statements true. Remember what a formula is!

11. The inequality $|4x + 7| < 5$ is equivalent to the compact compound inequality _____.
12. The formula for the slope of a line through two points (x_1, y_1) and (x_2, y_2) is _____.
13. The slope-intercept form of the equation of a line is _____.
14. The standard form for the equation of a line is _____.
15. The point-slope form of the equation of a line is _____.
16. Write $5x - 7y = 12$ in slope-intercept form _____.
17. Write $y = \frac{2}{3}x - \frac{4}{5}$ in standard form _____.
18. Write the slope of the graph of $y = -3x + 8$ _____.
19. Write the y-intercept of the graph of $y = -3x + 8$ _____.
20. Write the x-intercept of the graph of $y = -3x + 8$ _____.

21. Write the x-intercept of $3x + 5y = 30$ _____.
22. Write the y-intercept of $3x + 5y = 30$ _____.
23. An _____ of a graph is a point where the graph intersects the x-axis.
24. A _____ of a graph is a point where the graph intersects the y-axis.
25. The graph of every _____ equation in two variables is a non-vertical line.
26. (10 pts) Consider the inequality $5x - 4y > 20$. Answer the following questions about this inequality by filling in the blanks.

Solution:

Write the boundary equation _____.

What is the x-intercept of the boundary line? _____.

What is the y-intercept of the boundary line? _____.

Sketch the boundary line on Fig. 1. **Label important points.**

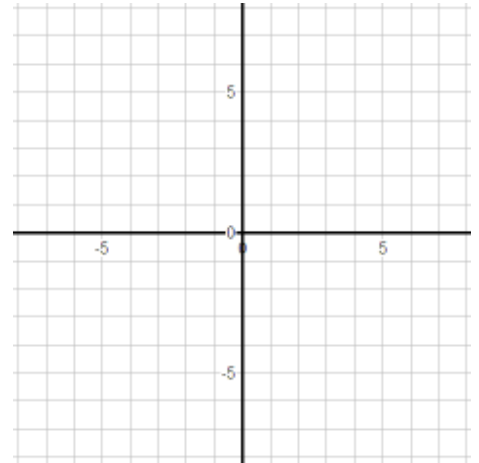


Fig. 1

Is $(0, -5)$ an acceptable test point? _____.

Is the origin an acceptable test point? _____.

If the point $(1, 1)$ is used as a test point we obtain _____ which is a _____ statement.

The half-plane containing the point $(1, 1)$ is the graph of the inequality _____.

The half-plane NOT containing the point $(1, 1)$ is the graph of the inequality _____.

Sketch the graph of $5x - 4y > 20$ on Fig 2. **Label important points.**

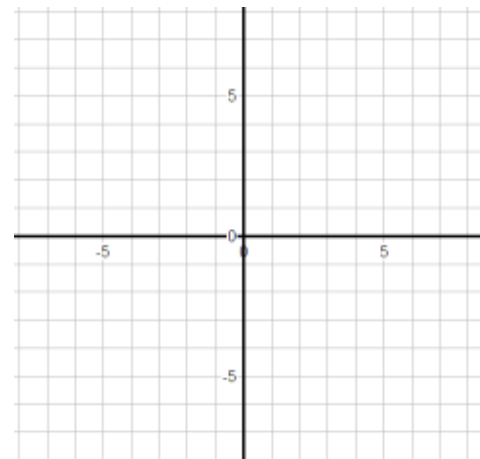


Fig. 2

Sketch the graph of $5x - 4y < 20$ on Fig 3. **Label important points.**

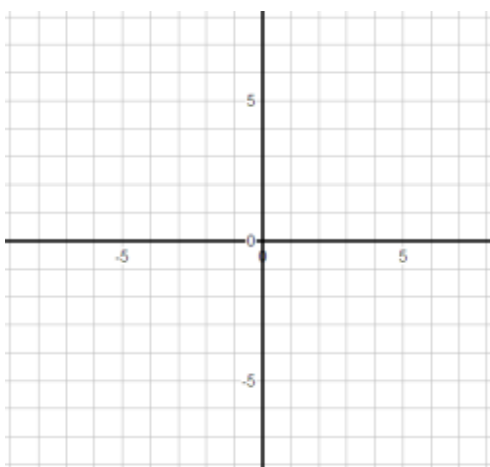


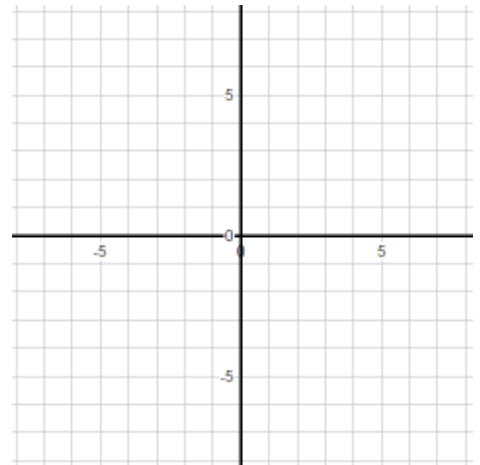
Fig. 3

27. To answer the questions in this problem you should assume

The solution set for $|ax + b| < k$ is A,
 the solution set for $|ax + b| > k$ is B,
 and the solution set for $|ax + b| = k$ is C.

- a) $A \cup B \cup C =$ _____
- b) $A \cap B =$ _____
- c) A is an _____ of the real number line.
- d) $A \cup B$ is all real numbers except those in _____
- e) C is a set containing _____ elements.

28. Sketch the graph of $2x - 5y > 10$. **Show your work and label important points.**



29. Which of the following are linear equations in two variables. Indicate your answer by circling YES or NO.

- a) $2x - 4y = 7$ (YES NO)
- b) $|3x - 2y| = 5$ (YES NO)
- c) $2x + 3y = 12$ (YES NO)
- d) $x^2 + y^2 = 4$ (YES NO)
- e) $x + y < 2$ (YES NO)

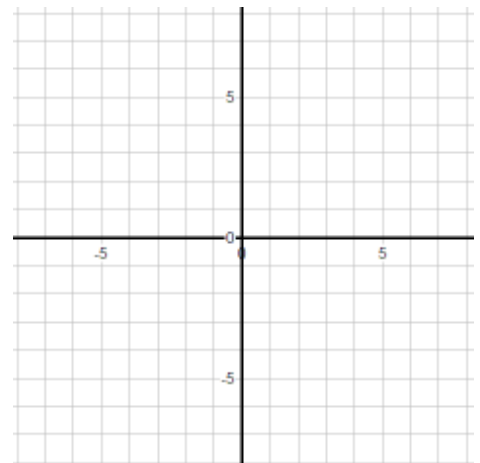
30. Consider the equation $5x - 6y = 30$.

If $x = 0$, then $y =$ _____ and therefore the point (_____, _____) is the _____ intercept.

If $y = 0$, then $x =$ _____ and therefore the point (_____, _____) is the _____ intercept.

If we use the origin $(0, 0)$ as a test point in the inequality $5x - 6y > 30$ we obtain $0 > 30$ which is (true false) **circle the correct word.**

Sketch the graph of $5x - 6y = 30$ and $5x - 6y > 30$ on the coordinate system at the right.



Show your work on Exercises 31 – 34 inclusive. All your work and answers must be exact!
No work –No Credit **Be neat!**

31. Calculate the slope of the line through the points (3, 2) and (–5, 7). **Remember: If you intend to use a formula, state the formula and then use it. (Plan your work and work your plan).**

32. Solve the inequality $|5x - 7| > 8$.

33. Find the equation of the line through the point (3, –1) with slope $\frac{2}{5}$. **Write the equation in slope intercept form. Remember: If you intend to use a formula, state the formula and then use it. (Plan your work and work your plan).**

34. Solve the inequality $\left| \frac{-2x - 1}{3} \right| < 2$. Write the solution set in interval notation.