

NAME: \_\_\_\_\_ Score \_\_\_\_\_/100  
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

Circle T or F, whichever is correct. 2 pts. each for 1 – 35. 3 pts. each for 36 – 43.

1. T F If any expression is added to both sides of an inequality the resulting inequality is equivalent to the original inequality.
2. T F If both sides of an inequality are multiplied by the same real number, the resulting inequality is equivalent to the original inequality.
3. T F The graph of an inequality in one variable is a point.
4. T F The graph of a linear equation in two variables is a non-vertical line.
5. T F The equation  $y - y_1 = m(x - x_1)$  is called the slope-intercept form of the equation of a line.
6. T F The graph of a linear equation in two variables may be a vertical line.
7. T F A horizontal line may be the graph of a linear equation in two variables.
8. T F If both sides of an equation are multiplied by the same algebraic expression, the resulting equation is equivalent to the original equation.
9. T F Every linear equation in two variables has exactly one solution.
10. T F Two lines are parallel if their slopes are negative reciprocals of each other.

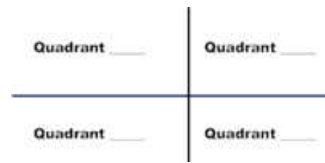
Fill in each of the blanks to make the statements true.

11. Two inequalities are \_\_\_\_\_ inequalities if they have the same solution sets.
12. If both sides of an inequality are multiplied by the same \_\_\_\_\_ real number and the inequality symbol is \_\_\_\_\_, the resulting inequality is equivalent to the original inequality.
13. Write the set  $\{x \mid -3 < x < 6\}$  using interval notation \_\_\_\_\_.
14. Write the interval  $[2, 8)$  using set builder notation \_\_\_\_\_.
15. If any expression is added to both sides of an equation the resulting equation is \_\_\_\_\_ to the original equation.
16. The solution set for  $|3x - 2| = -7$  is \_\_\_\_\_.
17. Use interval notation without the intersection symbol to write the set  $\{x \mid 1 < x < 3\} \cap \{x \mid 2 < x < 6\}$  \_\_\_\_\_.
18. Sketch the graph of the set  $\{x \mid 1 < x < 3\} \cap \{x \mid 2 < x < 6\}$ . \_\_\_\_\_
19. Sketch the graph of the set  $(-2, 2]$  \_\_\_\_\_.

20. If the solution to an absolute value inequality  $|ax + b| > c$  is  $(-\infty, 4) \cup (5, +\infty)$  then the solution to the inequality  $|ax + b| < c$  is \_\_\_\_\_.
21. If the solution to an absolute value inequality  $|ax + b| > c$  is  $(-\infty, 4) \cup (5, +\infty)$  then the solution to the equality  $|ax + b| = c$  is \_\_\_\_\_.

**Questions 22– 27 are about the Cartesian coordinate system.**

22. A rectangular coordinate system (Cartesian coordinate system) consists of two perpendicular number lines. One number line is drawn \_\_\_\_\_ and the other is drawn \_\_\_\_\_.
23. The point where these number lines intersect is the \_\_\_\_\_ point on each number line.
24. The horizontal number line is usually called the \_\_\_\_\_.
25. The vertical number line is usually called the \_\_\_\_\_.
26. The point of intersection of the two number lines is called the \_\_\_\_\_ of the coordinate system.
27. Label the quadrants on the coordinate system.



28. The inequality  $|3x - 5| < 2$  is equivalent to the compound inequality \_\_\_\_\_.
29. Complete the definition of absolute value  $|x| = \begin{cases} \text{_____} \\ \text{_____} \end{cases}$
30. A linear equation in two variables is an equation that can be written in the form \_\_\_\_\_ where m and b are real numbers.
31. The graph of the equation  $y = \frac{\sqrt{7}}{3}x - \frac{11}{15}$  is a \_\_\_\_\_.
32. State the Law of Trichotomy.
33. Write the formula for the midpoint of the line segment joining  $(x_1, y_1)$  and  $(x_2, y_2)$ .
34. Write the formula for the length of the line segment joining  $(x_1, y_1)$  and  $(x_2, y_2)$ .
35. Write the formula for the slope of the line segment joining  $(x_1, y_1)$  and  $(x_2, y_2)$

**Show your work on exercises 36 – 42 inclusive unless otherwise directed. Words are good!**

36. a. What is the solution set for  $|3x + 5| < 7$ .

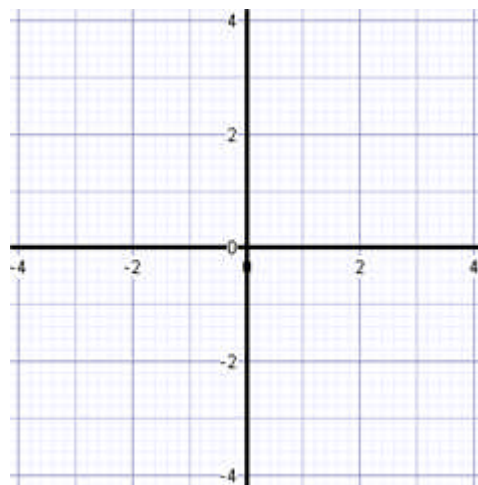
b. What is the solution set for  $|3x + 5| > 7$ . NO work required.

c. What is the solution set for  $|3x + 5| = 7$ . NO work required.

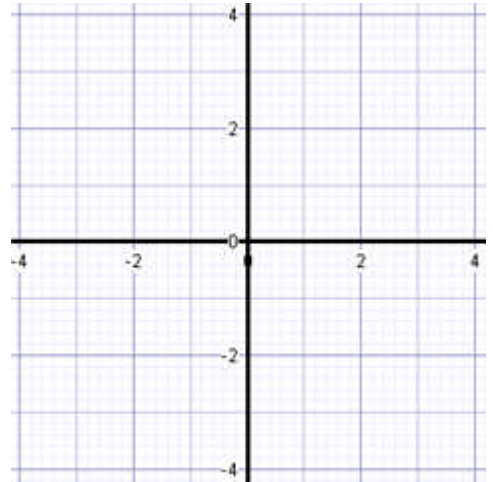
37. Write the equation (in slope-intercept form) of the line with slope 5 and y-intercept  $\frac{2}{3}$ . (NO work required)

38. Write the equation (in slope-intercept form) of the line through (2, -3) with slope 5.

39. Sketch the graph of  $y = 2x - 3$ . Label the intercepts. Show your work.



40. Sketch the graph of  $3x - 2y = 6$ . Label the intercepts. Show your work.



41. Write  $3x - 2y = 6$  in slope-intercept form. Show your work.

42. What is the slope of the graph of the equation  $5x - 7y = -4$ . Show your work.

43. Describe the process for finding the equation of the line through two given points  $P_1$  and  $P_2$ .

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