Assignment

Write

Describe a half-plane in your own words.

Remember

The graph of a linear inequality in two variables is the half-plane that contains all the solutions. If the inequality symbol is ≥ or ≤, the graph shows a solid boundary line because the line is part of the solution set. If the symbol is > or <, the boundary line is a dashed line because no point on the line is a solution.

Practice

1. Jeremy is working two jobs to save money for his college education. He makes $8 per hour working for his uncle at Pizza Pie bussing tables and $10 per hour tutoring peers after school in math. His goal is to make $160 per week.
   a. If Jeremy works 8 hours at Pizza Pie and tutors 11 hours during the week, does he reach his goal?
   b. Write an expression to represent the total amount of money Jeremy makes in a week from working both jobs. Let x represent the number of hours he works at Pizza Pie and y represent the number of hours he tutors.
   c. After researching the costs of colleges, Jeremy decides he needs to make more than $160 each week. Write an inequality in two variables to represent the amount of money Jeremy needs to make.
   d. Graph the inequality from part (c).
   e. Is the point (0, 0) in the shaded region of the graph? Explain why or why not.
   f. According to the graph, if Jeremy works 5 hours at Pizza Pie and tutors for 10 hours, will he make more than $160? Explain why or why not.
   g. Due to days off from school, Jeremy will only be tutoring for 6 hours this week. Use the graph to determine the least amount of full hours he must work at Pizza Pie to still reach his goal. Then show that your result satisfies the inequality.
2. Graph each inequality on a coordinate plane.
   a. $x + 3y > 9$ b. $2x - 6y \leq 15$
   c. $2x + y < 6$ d. $3x - y \geq 1$

Stretch

Use what you know about absolute value functions to graph the inequality $y > 2|x - 3| - 5$.

Review

1. Solve each compound inequality. Graph the final solution on a number line.

   a. $-4 \leq 3x + 2 \leq 14$

   b. $\frac{1}{3}x + 3 \geq 4$ or $-x < 2$

2. Solve each system using the Linear Combinations Method.

   a. $\begin{cases} 8x - 6y = -20 \\ -16x + 7y = 30 \end{cases}$

   b. $\begin{cases} x + 3 = -7y + 3 \\ 2x - 8y = 22 \end{cases}$

3. Write the equation of the line that has the given slope and passes through the point given.

   a. $m = \frac{2}{3}$; $(2, -4)$

   b. $m = -4$; $(0.5, 7)$