

Assignment

Write

Match each definition to its corresponding term.

1. compound inequality
 2. conjunction
 3. disjunction
- a. a solution of a compound inequality in the form $a < x < b$, where a and b are any real numbers
 - b. an inequality that is formed by the union *or*, or the intersection *and*, of two simple inequalities
 - c. a solution of a compound inequality in the form $x < a$ or $x > b$, where a and b are any real numbers

Remember

The solution of a compound inequality in the form $a < x < b$, where a and b are any real numbers, is the part or parts of the solutions that satisfy both of the inequalities. The solution of a compound inequality in the form $x < a$ or $x > b$, where a and b are any real numbers, is the part or parts of the solution that satisfy either inequality.

Practice

1. Taneisha's family has signed up for a new cell phone plan. Taneisha now has a limit on the number of texts she can send or receive each month. She can text no more than 300 times per month.
 - a. Write a compound inequality to represent the number of texts, n , that Taneisha can send in a month.
 - b. Write the compound inequality in compact form.
 - c. Graph the inequality. Describe your number line representation.
2. John owns a 50-acre apple orchard. Among his many concerns during the growing season is the amount of rainfall. Unfavorable conditions such as drought and flooding will affect tree production. John does not want rainfall amounts to be less than 10 inches or more than 50 inches.
 - a. Represent the undesirable rainfall amounts on a number line.
 - b. Write a compound inequality to represent the same information. Define your variable.
3. At John's apple orchard, the profit he will make depends on the number of bushels he grows and sells. He makes \$25 per bushel but must subtract \$300,000 for costs associated with growing the trees in order to calculate his profit.
 - a. Write an expression to represent the profit John will make. Let b represent the number of bushels he will produce and sell.

- b. John must make at least \$80,000 to pay the bills, but he does not want to make more than \$250,000 because it will put him in a higher tax bracket. Write a compound inequality that represents the amount of profit John can make.
- c. Solve the compound inequality. Show your work.
- d. Graph the solution to the compound inequality. Describe the solution region in terms of the problem situation.
4. Solve each compound inequality.
- | | |
|---------------------------------------|---------------------------|
| a. $-6x + 1 > -5$ and $3x + 4 \geq 1$ | b. $1 \leq 3j + 4 < 13$ |
| c. $2k - 4 \geq 2$ or $-4k + 6 > 3$ | d. $-10 < 4t - 2 \leq 10$ |

Stretch

A company produces T-shirts. There is a fixed monthly cost of \$500 to produce the T-shirts and a cost of \$4.50 per T-shirt for production. The company plans on selling the T-shirts for \$11.50 each.

Write an expression to determine the cost to produce x t-shirts in a month. The company would like the profit next month to be at least \$2,000 but no more than \$10,000 for tax purposes. Write and solve a compound inequality that represents the amount of profit the company can make. Describe the solution region in terms of the problem situation.

Review

- Consider the explicit formula $a_n = \frac{3}{2} + \frac{1}{2}(n - 1)$.
 - Write the formula in function notation.
 - Graph the function on a coordinate plane. Label the first 3 values of the sequence on the graph.
- Joan received \$100 in gift cards for an online music store. Each time she buys a new song it costs \$1.29. She has already bought 10 songs. Write an inequality that models this situation. Then determine the number of songs she can buy and not run out of gift card money.
- Evaluate each function for the given value of x .
 - $f(x) = 3x + 2(8 - x)$ for $x = -2$
 - $f(x) = -\frac{2}{9}x - 4\left(\frac{1}{8}x + 3\right)$ for $x = 3$