Compound Inequalities

Introducing Compound Inequalities

We use inequalities for lots of things:

- Is it hot out? (temperature>80°)
- Did I get paid enough for painting that fence? (paid >= $100)
- Are the cookies finished baking? (timer=0)

What other examples can you come up with?

Introducing Compound Inequalities

Many times we need to *combine* inequalities:

- Should I go to the beach?

  `(temperature>80° and weather="sunny")`

- Was this burrito worth the price?

  `(taste="delicious" and price≤$15)`

Introducing Compound Inequalities

Expressions using **`and`** only produce `true` if both of their sub-expressions are `true`.
Expressions using **`or`** produce `true` if **either** of their sub-expressions are `true`.

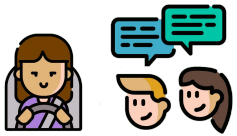
True or False?

- I'm wearing a red shirt and I'm a math teacher.
- I'm an NBA basketball star or I'm having pizza for lunch.

Write your own compound boolean statements.

Introducing Compound Inequalities

Complete: Converting Circles of Evaluation with Booleans to Code and Compound Inequalities — Practice.



Solutions and Non-Solutions of Compound Inequalities

Identify 4 solutions and 4 non-solutions for each of the following inequalities.

- $x > 5$
- $x < 15$

What about the solution set of $x > 5$ and $x < 15$? What number make both of these inequality expression true?

What about the solution set of $x > 5$ or $x < 15$? What number make at least one of these inequality expressions true?

Solutions and Non-Solutions of Compound Inequalities

This starter file includes two special functions.

`and-intersection` takes in two functions and a list of numbers and produces a graph with the points and the shaded ***intersection*** of values that make both of the inequalities true. *Note: Some pairs of inequalities do not intersect at all and therefore have **no solutions**.*

`or-union` takes in two functions and a list of numbers and produces a graph with the points and the shaded ***union*** of values that make either or both of the inequalities true. *Note: Some **unions** include **all real numbers**; they have have **infinite solutions** that satisfy at least one of the inequalities.*

Turn to Compound Inequalities:Solutions & Non-Solutions & explore the compound inequalities listed using this starter file.

Solutions and Non-Solutions of Compound Inequalities

How did the graphs of intersections and unions differ?

Additional Exercises

Unions and Intersections - Matching Inequality Functions to graphs of their solution sets - Desmos Activity

Circles of Evaluation to Code (2)