**COMPOUND INEQUALITIES** consists of two inequalities connected by or .

Inequalities containing is true only if both inequalities are true.

**Solution**: The solution of the compound inequality containing is a solution of **both** inequalities.

**Graph**: The **INTERSECTION** of the graphs of two inequalities. It can be found by graphing each inequality and then determining where the graphs overlap.

**Example**: Graph the solution set of and .

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

The solution set is.

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

**Sample Problem 1:** Write an inequality that represents the set of numbers and graph the inequality.

1. All real numbers that are greater than zero and less than or equal to .

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

The solution set is.

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

1. All real numbers that are less than and greater than .

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

The solution set is

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

Inequalities containing is true only if one or both of the inequalities are true.

**Solution**: The solution of the compound inequality containing is a solution of **either** inequality, not necessarily both.

**Graph**: The **UNION** of the graphs of two inequalities. It can be found by graphing each inequality.

**Example**: Graph the solution set of or .

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

The solution set isor.

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**-3**

**-4**

**5**

**6**

**-5**

**-6**

**Sample Problem 2:** Solve each inequality and graph the solution set.

1. or

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  | | | |  | | | |

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

The solution set is

**0**

**1**

**2**

**-1**

**-2**

**-3**

**-4**

**-5**

**-6**

**-7**

**-8**

**-9**

**-10**

1. or

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  |  |  | or | |  |  |  |
|  | | | |  | | | |

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

The solution set is.

**0**

**1**

**2**

**3**

**4**

**-1**

**-2**

**5**

**6**

**7**

**8**

**9**

**10**

**Sample Problem 3:** On an interstate highway, the minimum and maximum speed limit is 40 mph and 70 mph, respectively. Write and graph the compound inequality that describes the speed at which a vehicle should maintain.

**0**

**10**

**20**

**30**

**40**

**-10**

**-20**

**50**

**60**

**70**

**80**

**90**

**100**

**0**

**10**

**20**

**30**

**40**

**-10**

**-20**

**50**

**60**

**70**

**80**

**90**

**100**

The solution set is

**0**

**10**

**20**

**30**

**40**

**-10**

**-20**

**50**

**60**

**70**

**80**

**90**

**100**