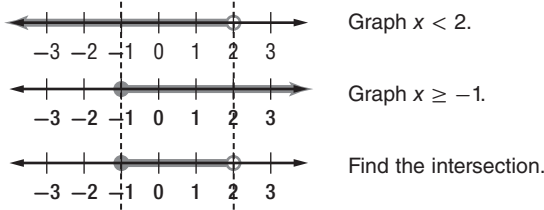


5-4 Study Guide and Intervention

Solving Compound Inequalities

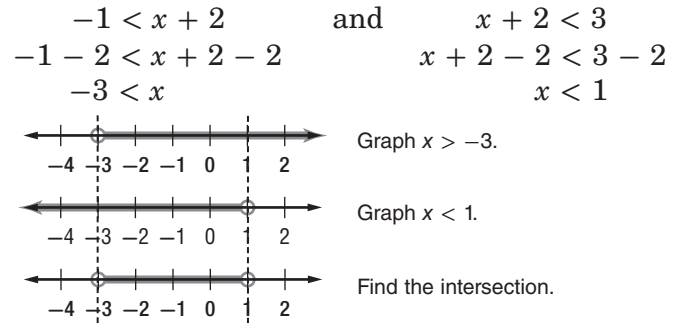
Inequalities Containing *and* A compound inequality containing *and* is true only if both inequalities are true. The graph of a compound inequality containing *and* is the **intersection** of the graphs of the two inequalities. Every solution of the compound inequality must be a solution of both inequalities.

Example 1 Graph the solution set of $x < 2$ and $x \geq -1$.



The solution set is $\{x \mid -1 \leq x < 2\}$.

Example 2 Solve $-1 < x + 2 < 3$. Then graph the solution set.

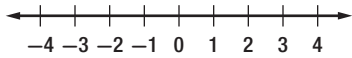


The solution set is $\{x \mid -3 < x < 1\}$.

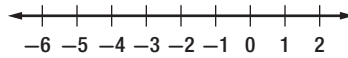
Exercises

Graph the solution set of each compound inequality.

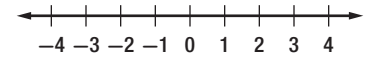
1. $b > -1$ and $b \leq 3$



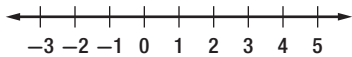
2. $2 \geq q \geq -5$



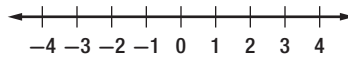
3. $x > -3$ and $x \leq 4$



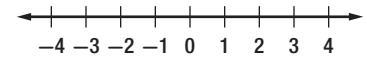
4. $-2 \leq p < 4$



5. $-3 < d$ and $d < 2$

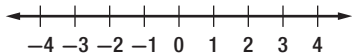


6. $-1 \leq p \leq 3$

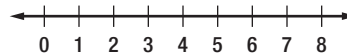


Solve each compound inequality. Then graph the solution set.

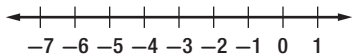
7. $4 < w + 3 \leq 5$



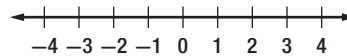
8. $-3 \leq p - 5 < 2$



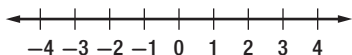
9. $-4 < x + 2 \leq -2$



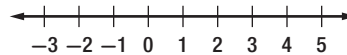
10. $y - 1 < 2$ and $y + 2 \geq 1$



11. $n - 2 > -3$ and $n + 4 < 6$



12. $d - 3 < 6d + 12 < 2d + 32$



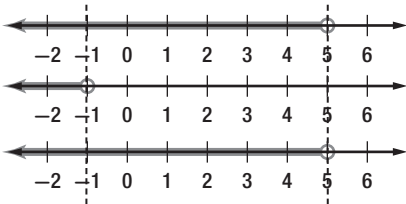
5-4 Study Guide and Intervention *(continued)*

Solving Compound Inequalities

Inequalities Containing or A compound inequality containing *or* is true if one or both of the inequalities are true. The graph of a compound inequality containing *or* is the **union** of the graphs of the two inequalities. The union can be found by graphing both inequalities on the same number line. A solution of the compound inequality is a solution of either inequality, not necessarily both.

Example Solve $2a + 1 < 11$ or $a > 3a + 2$. Then graph the solution set.

| | | |
|-------------------------------|----|---------------------------------|
| $2a + 1 < 11$ | or | $a > 3a + 2$ |
| $2a + 1 - 1 < 11 - 1$ | | $a - 3a > 3a - 3a + 2$ |
| $2a < 10$ | | $-2a > 2$ |
| $\frac{2a}{2} < \frac{10}{2}$ | | $\frac{-2a}{-2} < \frac{2}{-2}$ |
| $a < 5$ | | $a < -1$ |



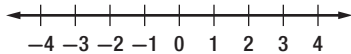
Graph $a < 5$.
Graph $a < -1$.
Find the union.

The solution set is $\{a \mid a < 5\}$.

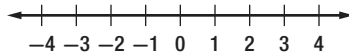
Exercises

Graph the solution set of each compound inequality.

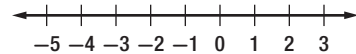
1. $b > 2$ or $b \leq -3$



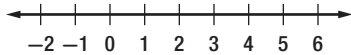
2. $3 \geq q$ or $q \leq 1$



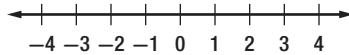
3. $y \leq -4$ or $y > 0$



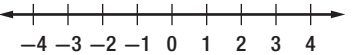
4. $4 \leq p$ or $p < 8$



5. $-3 < d$ or $d < 2$

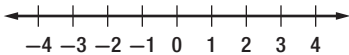


6. $-2 \leq x$ or $3 \leq x$

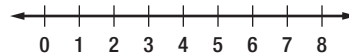


Solve each compound inequality. Then graph the solution set.

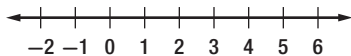
7. $3 < 3w$ or $3w \geq 9$



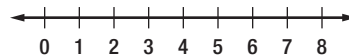
8. $-3p + 1 \leq -11$ or $p < 2$



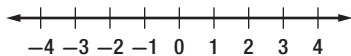
9. $2x + 4 \leq 6$ or $x \geq 2x - 4$



10. $2y + 2 < 12$ or $y - 3 \geq 2y$



11. $\frac{1}{2}n > -2$ or $2n - 2 < 6 + n$



12. $3a + 2 \geq 5$ or $7 + 3a < 2a + 6$

