

# Solution Manual for College Algebra 4th Edition by Robert F. Blitzer ISBN 0132191415 9780132191418

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## Mini-Lecture 1.7

### Linear Inequalities and Absolute Value Inequalities

#### Learning Objectives:

1. Use interval notation.
2. Find intersections and unions of intervals.
3. Solve linear inequalities.
4. Recognize inequalities with no solution or all real numbers as solutions.
5. Solve compound inequalities.
6. Solve absolute value inequalities.

#### Examples:

1. Find the set  $[-3, \infty) \cup (-\infty, 1)$ .

Solve and write the solution in interval notation.

$$2. \frac{3x+2}{4} - 3 \leq \frac{9x+1}{8} \quad 3. 5 \leq 3x - 4 < 18 \quad 4. -16 > -2 | 4x - 5 |$$

#### Teaching Notes:

- Discourage the use of open and closed circles on graphs. Using parentheses and brackets reinforces the concepts of interval notation.
- Emphasize the table “Intervals on the Real Number Line” in the book.
- If students are having trouble with the concepts of intersection or union, encourage them to draw the graphs and use two different colors.
- Many students will solve inequalities incorrectly if the variable is on the right side (Ex.  $-2 \geq x$ ). Encourage them to flip the inequality around before writing the interval notation.
- Do not allow students to break an absolute value inequality in the form  $|X| \leq c$

(or  $X \neq c$ ) into two separate inequalities (Ex.  $x + 1 < 2$  written as  $x + 1 > -2$  and  $x + 1 < 2$ ). This does not reinforce the concept of intersection.

Answer: 1)  $[-3, 1)$ ; 2)  $[-7, \infty)$ ; 3)  $3, \frac{22}{3}$ ; 4)  $-\infty, -\frac{3}{4} \cup \frac{13}{4}, \infty$