

ALG I - §3-2 NOTES

Algebra 1

Lesson 3.2: Solving Inequalities using Addition and Subtraction

Objective: To use addition or subtraction to solve inequalities

Warm-Up: Define a variable, write an inequality, and graph the inequality.

1. You need to have at least \$250 to open a bank account at a particular bank.

let $m =$ amt of money to open a bank acct

$$m \geq 250$$

2. The restaurant can seat no more than 98 people.

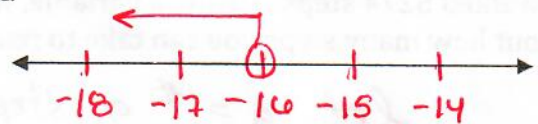
let $p =$ # of people a restaurant can seat

$$p \leq 98$$

Example 1 Solve each inequality and graph its solution.

a. $x + 7 < -9$

$$\begin{array}{r} -7 \quad -7 \\ \hline x < -16 \end{array}$$



b. $12 \leq m - 8$

$$\begin{array}{r} +8 \quad +8 \\ \hline 20 \leq m \end{array}$$

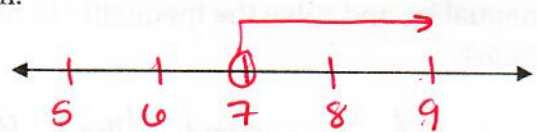
$$m \geq 20$$



Example 2 Solve each inequality and graph its solution.

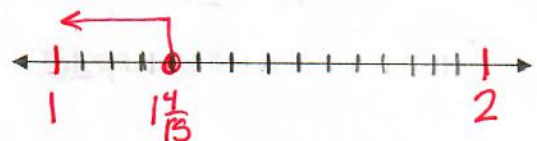
a. $y - 2 + 5 > 10$

$$\begin{array}{r} y + 3 > 10 \\ -3 \quad -3 \\ \hline y > 7 \end{array}$$



b. $\left(\frac{2}{3}\right) \geq (p) - \left(\frac{3}{5}\right)$

$$\begin{array}{r} 10 \geq 15p - 9 \\ +9 \quad +9 \\ \hline 19 \geq 15p \end{array}$$



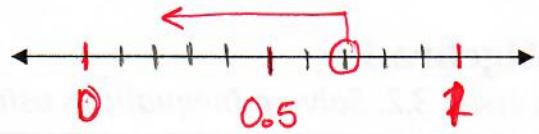
$$\begin{array}{r} 19 \geq 15p \\ \frac{19}{15} \geq \frac{15}{15}p \\ 1\frac{4}{15} \geq p \end{array}$$

$$p \leq \frac{19}{15} \text{ or } 1\frac{4}{15}$$

Example 3 Solve each inequality and graph its solution.

a. $-4.2 + m < -3.5$
 $\quad +4.2 \quad +4.2$

$$m < 0.7$$



b. $\frac{1}{2} \geq h + 1\frac{3}{4}$

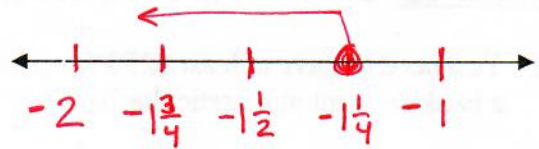
$$4\left(\frac{1}{2}\right) \geq 4(h) + 4\left(1\frac{3}{4}\right)$$

$$2 \geq 4h + 7$$

$$-5 \geq 4h$$

$$-\frac{5}{4} \geq h$$

$$h \leq -\frac{5}{4} \text{ or } -1\frac{1}{4}$$



Example 4 (Question 42 p. 175)

Your goal is to take at least 10,000 steps per day. According to your pedometer, you have walked 5274 steps. Define a variable, write an inequality, and solve the inequality to find out how many steps you can take to reach your goal.

let $g = \#$ of steps to reach goal

$$5274 + g \geq 10,000$$

$$g \geq 4726$$

You need to walk at least 4726 steps to reach your goal.

Example 5 (Question 44 p. 175)

You earn \$250 per month from your part-time job. You are in a kayaking club that costs \$20 per month, and you save at least \$100 each month. Define a variable, write an inequality, and solve the inequality to find the possible amount you have left to spend each month.

let $x =$ amt that you have left to spend each month

$$x \leq 250 - 20 - 100$$

$$\therefore x \leq 130$$

You have at most \$130 to spend per month.