

**Concept and Vocabulary:**

1. The solution set of  $x < 5$  can be expressed in interval notation as \_\_\_\_\_.
2. The solution set of  $x \geq 2$  can be expressed in interval notation as \_\_\_\_\_.
3. The addition property of inequality states that if  $a < b$ , then  $a + c$  \_\_\_\_\_.
7. In solving an inequality, if you eliminate the variable and obtain a false statement such as  $0 > 1$ , the solution set is \_\_\_\_\_.

**Practice Exercises:**

In exercises 1 - 11, odd, graph the solutions of each inequality on a number line.

1.  $x > 5$

7.  $x \leq 4.5$

3.  $x < -2$

9.  $-2 < x \leq 6$

5.  $x \geq -4$

11.  $-1 < x < 3$

In exercises 13 - 19 odd, express the solution set of each inequality in interval notation and graph the interval.

13.  $x \leq 3$

17.  $x \leq 0$

15.  $x > \frac{5}{2}$

19.  $x < 4$

Use the addition property of inequality to solve each inequality in exercises 21 - 37 every other odd, graph the solution set on a number line then write it in interval and set notation.

21.  $x - 3 > 4$

33.  $x - \frac{2}{3} > \frac{1}{2}$

25.  $y - 2 < 0$

37.  $-15y + 13 > 13 - 16y$

29.  $5x - 9 < 4x + 7$

Use the multiplication property of inequality to solve each inequality in exercises 39 -55 every other odd, graph the solution set on a number line then write it in interval and set notation.

39.  $\frac{1}{2}x < 4$

43.  $4x < 20$

$$47. -3x < 15$$

$$55. -x < 4$$

$$51. -16x > -48$$

*In exercises 57 - 79 every other odd, solve the inequality, graph the solution set on a number line then write it in interval and set notation.*

$$57. 2x - 3 > 7$$

$$65. 5 - x \leq 1$$

$$61. 3 - 7x \leq 17$$

$$69. 2y - 5 < 5y - 11$$

$$73. 3(x + 1) - 5 < 2x + 1$$

$$79. 1 - \frac{x}{2} > 4$$

$$75. 8x + 3 > 3(2x + 1) - x + 5$$

In exercises 81 - 89 every other odd, solve the inequality. **You do NOT need to graph the solution but you do need to write the set of solutions in set notation!**

$$81. 4x - 4 < 4(x - 5)$$

$$89. 5x - 4 \leq 4(x - 1)$$

$$85. 7x \leq 7(x - 2)$$

## Applications:

An online test of English spelling looked at how well people spelled difficult words. The bar graph in the text shows the percentage of people who spelled each word correctly. Let  $x$  represent the percentage who spelled a word correctly. In exercises 99 - 103 odd, write the word or words described by the given inequality.

99)  $x \geq 30\%$

103)  $25\% \leq x < 40\%$

101)  $x < 20\%$

107) On two examinations, you have grades of 86 and 88. There is an optional final examination, which counts as one grade. You decide to take the final in order to get a course grade of A, meaning a final average of at least 90.

a. What must you get on the final exam to earn an A in the course?

b. By taking the final, if you do poorly, you might risk the B that you have in the

course based on the first two exam grades. If your final average is less than 80, you will lose your B in the course. Describe the grades on the final that will cause this to happen.

109) A car can be rented from Continental Rental for \$80 per week plus \$0.25 for each mile driven. How many miles can you travel if you can spend at most \$400 for the week?

111) An elevator at a construction site has a maximum capacity of 3000 pounds. If the elevator operator weighs 245 pounds and each cement bag weighs 95 pounds, how many bags of cement can be safely lifted on the elevator in one trip?