**Name:**

***Study Guide 158 ~*** *Solutions to Inequalities*

Recall the meaning of these symbols:

**<**

Less

Than

**>**

Greater

Than

**≤**

Less Than

Or Equal To

**≥**

Greater Than

Or Equal To

**Jimmy and The Cannibal**

 Little Jimmy has always been very short. Most of his friends have already ridden *The Cannibal*, the newest rollercoaster at Lagoon Amusement Park. When will he get to finally ride?

The park’s requires riders to be at least 50” tall to ride The Cannibal. Right now, Jimmy is 42” tall. His doctor says that he is currently growing about two inches taller every year.

1. Will he be able to ride The Cannibal in two years? Explain your answer.

We could try this equation in a more mathematical way if we used an inequality. Let y represent the number of years that Jimmy needs to wait. Then we can describe the situation with the statement 42 + 2y > 50

1. Explain why this inequality describes the situation.

We can show that three years is not enough if we substitute three for the variable.

42 + 2(3) ≥ 50

42 + 6 ≥ 50

48 ≥ 50 *This is a false statement because 49 is NOT greater than 50*

Because we obtained a false statement, the number three is not a solution to the inequality. For Jimmy, this means that three years is not enough. Let’s try six years.

42 + 2(6) ≥ 50

42 + 12 ≥ 50

54 ≥ 50 *This is true*

Using a value of six results in a true statement. So six is a solution for the inequality.

1. Substitute five into the inequality to see whether five is a solution.
2. What happens if you try four?

In the previous question, you should have gotten a result of 50 ≥ 50. This is true, because 50 is equal to 50. What was the value we needed to put into the variable to get that answer? It was four. By now, we should see that for any number of years less than four, Jimmy won’t yet be tall enough. But for any number of years four or greater, he will be. The short way to write this is:

y ≥ 4

This is called the **solution set** to the inequality 42 + 2y > 50.

**K’Vaughn’s Jeans**

K’Vaughn is buying some new pairs of jeans for school. His mom gave him $48 to shop with. At the store K’Vaughn sees that they are charging $16 for each pair of jeans.

5. Write an inequality to describe how many pairs of jeans he can buy.

6. To answer this question, you’ll need to make sure to have the correct answer to the previous question. It’s upside-down at the bottom of this page. Substitute eight into the inequality to see whether K’Vaughn can buy eight pairs of jeans.

7. Substitute two into the inequality to see whether two is a solution.

16j ≤ 48

8. What is the highest number that works as a solution?

9. Write the solution set for K’Vaughn’s situation

**Practice**

10. Choose a number that is a solution to the inequality 11f – 14 > 19

11. Show that your number is a solution

12. Choose a number that is NOT a solution to the inequality 11f – 14 > 19

13. Show that your number is not a solution

14. Write the solution set to the inequality 5g > 45

15. Choose a number that is a solution to the previous inequality and show that your number is a solution.

16. Choose a number that is not a solution to the previous inequality and show that your number is not a solution

Write the solution set for the given inequalities

17. 16 + m < 90

18.

19. 2b + 1 > 7

20. 15 – h ≥ 10

**Answers**

1. No. In two years, he will only be 46" tall.

2. If y represents the number of years, we can multiply that by two, since he grows two inches each year. Add that onto the 45" of height that he currently has. The total needs to be greater than or equal to 50".

3. Yes. 52 is greater than 50

4. The result is 50 ≥ 50

5. 16j ≤ 48

6. No, because 128 ≤ 48 is a false statement

7. Yes, because 32 ≤ 48 is true

8. Three

9. j ≤ 3

10. Any number greater than 3 is a solution

11. Use your answer from problem #10. Substitute that number for f

12. Any number less than 3 is not a solution

13. Use your answer from problem #12. Substitute that number for f

14. g > 9

15. Any number greater than 9 is a solution

16. Any number less than 9 is not a solution

17. m < 74

18. k ≤ 21

19. b > 3

20. h ≥ 5