

## Opener

1. Write how you would say the following two inequalities.

$x > 3$   $x$  is greater than 3

$3 < x$  3 is less than  $x$

- Give an example of a solution for each of them.

$x > 3$ : 4, 5... so everything greater than 3

$3 < x$ : something

2. Grandma gives Brooklyn a piggy bank with \$25 when she was born. Every year, on her birthday, Brooklyn puts \$20 in her bank.

a. Write an equation to tell how much money Brooklyn will have in any given year.  $25 + 20b = t$

$t = \text{total } \$$   
 $b = \# \text{ of birthdays}$

b. How would we change the equation if on her birthday, Brooklyn puts at least \$20 in her bank?  $25 + 20b \leq t$

3. On your trip to Hawaii you need to rent a convertible. There is a charge for each rented car of \$30 for insurance and the daily cost is \$90 every day.

a. Write an equation to show the total cost to rent the convertible.  $y = 30 + 90d$

b. How would we change the equation if it was no more than \$30 fee for insurance?

$$y \leq 30 + 90d$$

Questions on 3A Is Greater Than, Is Less Than

**3A Is Greater Than (>), Is Less Than (<)**

Name \_\_\_\_\_ Per: \_\_\_\_\_

SHOW YOUR WORK AND IN PENCIL

1. Use the inequality  $4 < 6$  to complete each row in the table.

Apply each operation to the original inequality $4 < 6$	Show the operation and Result	Is the inequality true or false? Explain.
Add 3 to both sides of $4 < 6$	$4 + 3 < 6 + 3$ $7 < 9$	True; 7 is less than 9.
Add (-3) to both sides of $4 < 6$	$4 \underline{\quad} < 6 \underline{\quad}$ , so $\underline{\quad} < \underline{\quad}$	
Subtract 10 from both sides of $4 < 6$		
Multiply both sides of $4 < 6$ by 3		
Divide both sides of $4 < 6$ by 2		
Multiply both sides of $4 < 6$ by (-3)		
Divide both sides of $4 < 6$ by (-2)		

2. From the table above, explain when to switch the sign when solving an inequality.

**Solve the following inequalities. Write into words what your solution is.**

3.  $5w - 2 > -7$

5.  $-2m + 12 > -10$

7.  $-5(b + 1) \geq 25 + b$

4.  $-3t + 9 < 3$

6.  $-4(y + 8) \leq 24$

8.  $\frac{1}{2}k > 14 + k$

**Solve the following multi-step inequalities.**

9.  $2(a - 1) + 8 > 4a + 6$

10.  $3 + (x + 3) < -9 + 4x$

11.  $-2(a - 1) + 8 > 4a + 6$

12.  $3 + x + 3 < -9 + 4x$

13. Fill in the following table with the following words:

*Is Greater Than, Is Less Than, Is Greater Than or Equal to, Is Less Than or Equal to, Is No More Than, Is At Least, Is At Most, Is Fewer Than, Is Almost, Maximum, Minimum*

$\geq$	$>$	$\leq$	$<$

Write the following word sentences as an inequality. Solve and find the solution set.

14. A number and seven *is less than* four.

15. A number plus 5 *is greater than or equal to* 8 and twice the number.

16. Four times a number *is greater than* 20 decreased by the number

17. One-half the height multiplied by the sum of base 1 and base 2 equals the area of a trapezoid. Solve for h.  
For EC, solve for base 1.

Write an inequality to match the story problem and solve for your variable. SYW.

18. Subway sells an 8-foot sub sandwich for *at most* \$22.40. Write the inequality and find the possible solutions of the cost per foot?

19. Zach saved \$55 toward the purchase of an iPod. The cost of the iPods *is at least* \$145. Write the inequality and then find how much more does Zach need to save to buy the iPod?

20. Dustin and his best friend Jeremy found some money buried in a field. They split the money evenly, each getting *more than* \$24.28. How much money did they find in total?

21. Last Friday Marissa had \$22.50. Over the weekend, she received some money for babysitting. She now has *less than* \$32.00. How much money did she get for babysitting?

22. The speed *limit* on a city street is a *maximum* of 25 miles per hour. Write an inequality to describe a car's possible speed.

 Grade 3A Is Greater Than, Is Less Than

# Study Guide

**3B Solving 2-variable Inequalities**

Name: \_\_\_\_\_ Per: \_\_\_\_\_

SHOW YOUR WORK FOR FULL CREDIT. NO WORK IN PEN.

Solve the following.

1.  $16x - 12 > 2(7 - 5x)$

2.  $2(x + 8) > 4x + 12$

3.  $3y + 4 \leq 18 - (y + 6)$

Solve the following inequalities for s.

4.  $-8s > -6(8b - 4)$

5.  $-s + 4w \leq -25 + 3(2w + 5)$

6.  $5 - (7 + 2s) - 2d > d + 10$

Solve the following inequalities for y. State the slope and y-intercept.

7.  $x - 2y > 10 + 3x$

8.  $4x - 7y > 10 - (y + 2)$

Solved: \_\_\_\_\_

Solved: \_\_\_\_\_

Slope: \_\_\_\_\_ Y-intercept: \_\_\_\_\_

Slope: \_\_\_\_\_ Y-intercept: \_\_\_\_\_

9.  $-3x - 6y \leq 12 + 3(y - 9)$

10.  $-2(x - 4) + x - 2y \geq 10$

Solved: \_\_\_\_\_

Solved: \_\_\_\_\_

Slope: \_\_\_\_\_ Y-intercept: \_\_\_\_\_

Slope: \_\_\_\_\_ Y-intercept: \_\_\_\_\_

Solve the following multi-step inequalities. Justify (describe) your steps.

11.  $2r + 1 < 15 - 2(r + 3)$

12. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

13.  $2(4n^2 - 2) - 4n^2 \geq 21 - n^2$

14. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Write and then solve an inequality to represent the given situations.**

15. Andy has \$550 in a savings account at the beginning of the summer. He wants to have at least \$200 in the account by the end of the summer. He withdraws \$25 each week for food, clothes, and movie tickets.

- a. Inequality: \_\_\_\_\_
- b. How many weeks can the money last?

Solution: \_\_\_\_\_

16. Kimberly took a TOTAL of 6 nieces/nephews to a hockey game. She wants to buy them snacks.

- a. Inequality: \_\_\_\_\_
- b. How much can each child spend on snacks if Kimberly wants to spend *no more than* \$30 total? (don't worry about tax)

Solution: \_\_\_\_\_

17. The school is running a carnival to make money. Tickets sell for \$0.50 each, and they need to buy supplies for the carnival that cost \$50.

- a. Inequality: \_\_\_\_\_
- b. How many tickets must they sell to raise *at least* \$200 in profit?

Solution: \_\_\_\_\_

18. VHMS collected food for a food drive. We started with *no more than* 500 items and the students collected 100 items each day.

- a. Inequality: \_\_\_\_\_
- b. If the school collected donations for 5 days, how many items would we have collected?

Solution: \_\_\_\_\_

19. Your quiz grades are 78, 72, 87, 90, and the score on your fifth quiz will make your average quiz grade *at least* 82.

- a. Inequality: \_\_\_\_\_
- b. What is the score on the fifth quiz?

Solution: \_\_\_\_\_

**Tell whether the given value is a solution to the inequality (makes the inequality true) by evaluating the following inequalities for the given value.**

20.  $x - 1 < 7$ ; can  $x$  be 8?

21.  $7y < 27$ ;  $y = 8$

22.  $\frac{1}{2}x \geq 5$ ;  $x = 10$

Solution? YES / NO

Solution? YES / NO

Solution? YES / NO



Solve to find the solution set for the inequality:

$$6 - 4(6n + 7) < 122$$

$$6 - 24n - 28 < 122$$

$$-24n - 4 < 122$$

$$-24n < 126$$

$$n > -\frac{126}{24} \rightarrow n > -\frac{63}{12} \rightarrow n > -\frac{21}{4}$$

$$\frac{2(x^2 + 2)}{2} \geq \frac{8}{2} - \frac{2x^2}{2}$$

$$x^2 + 2 \geq 4 - x^2$$

$$2x^2 \geq 2$$

$$\sqrt{x^2} \geq \sqrt{1}$$

$$x \geq \pm 1$$

Solve the following linear inequality for y:

$$-3 - y > -3(x + 6)$$

$$\begin{array}{r} -3 - y > -3x - 18 \\ +3 \quad \quad \quad +3 \\ \hline -y > -3x - 15 \end{array}$$

Slope:                      Y-Intercept:

$$y < 3x + 15$$

$$m=3$$

$$y_{\text{int}}(0, 15)$$

From the following context, write the inequality:

A company wants to order company polos at a discount. The cost will include \$24 per shirt and a \$50 delivery fee. Write an inequality that represents how many shirts they must buy if they must spend a minimum of \$200 in order to receive a discount.

$$24s + 50 \geq 200$$



## Attachments

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3A Is Greater Than, Is Less Than KEYS.pdf

SM1\_Term\_1\_Booklet\_Key.notebook

3A Is Greater Than, Is Less Than KEY.notebook