TRANSLATING & SOLVING Inequalities

Translate	Solve
1 "Nine less than nine times a number is at least thirty-six."	
Inequality:	
2 "The sum of 4 and a number, divided by 2 is less than –6."	
Inequality:	
3 "–5 plus triple a number is no more than sixteen."	
Inequality:	
4 "The difference of 8 and six times a number is a minimum of sixty-eight."	
Inequality:	
5 "Eight plus one fourth of a number is less than or equal to six."	
Inequality:	
6 "The sum of –3 and four times a number is no more than –11."	
Inequality:	
7 "Half of the sum of a number and five is a maximum of ten."	
Inequality:	

TWO-STEP INEQUALITY WORD PROBLEMS

Directions: Define a variable, set up an inequality, then solve.

8 Peter spent half the money on his gift card on coffee. He loaded another $10 onto the gift card. How much was on the gift card to begin with if he now has at least $40 on the card?

Inequality	Solution

9 Megan wants to spend no more than $300 planning a party. She spent $75 on food and wants to buy decorations that are $10 each. How many decorations can she buy?

Inequality	Solution

10 A moving truck can carry no more than 1,480 pounds of cargo. Brian loaded 640 pounds into the truck already. He is loading boxes that weigh 70 pounds. How many boxes can he put into the truck?

Inequality	Solution

11 The 7th grade class is putting on a fundraising dance. They pay $400 to rent a hall for the dance. They plan to sell tickets for $15 each. How many tickets will they need to sell if they want to profit at least $1,495?

Inequality	Solution

12 Nancy has $240 in the bank. She wants to buy as many $15 video games as possible. How many video games could she buy if she wanted to keep at least $120 in the bank?

Inequality	Solution

13 A taxi charges a $2.35 fee plus $0.55 per mile. Melissa has no more than $15 to spend on her taxi ride. How many miles can she go?

Inequality	Solution

Name: _____ **Unit 3:** Equations & Inequalities

Date: _____ **Per:** _____ **Homework 11:** Inequality Word Problems

**** This is a 2-page document! ****

Directions: For each problem, define a variable and set up an inequality, then solve.

1. "The difference between a number and 7 is greater than -23."

Inequality	Solution

2. "Eight more than the quotient of a number and -5 is less than or equal to 6."

Inequality	Solution

3. "Two-thirds of a number plus 17 is at least 29."

Inequality	Solution

4. "25 subtracted from the product of a number and 7 is less than -39."

Inequality	Solution

5. "Ten minus three times a number is no more than 61."

Inequality	Solution

6. "The sum of a number and 9, divided by 4, is greater than or equal to -2."

Inequality	Solution

7. "-5 increased by one-half of a number is a maximum of 3."

Inequality	Solution

8. "14 less than twice a number is at most 50."

Inequality	Solution

9. Sally is going furniture shopping using her credit card. If her credit card has a limit of $2,000 and she is currently holding a balance of $763, how much can she afford to spend on furniture?

Inequality	Solution

10. Connor is taking a multiple-choice test in which each question is worth 4 points. How many questions must he get correct to score at least 90 points?

Inequality	Solution

11. Mrs. Hillard is purchasing candy hearts to distribute to the 28 students in her math class on Valentine's Day. If she would like each student to get a minimum of 15 candy hearts, how many will she need to purchase?

Inequality	Solution

12. Ralph is on a diet. He currently weighs 248 pounds. How many pounds would he need to lose if he wishes to weigh at most 195 pounds?

Inequality	Solution

13. Blake needed at least 225 votes to become president of his seventh-grade class. If three-fourths of the seventh-grade students voted for him and he won, how many seventh-grade students could there be?

Inequality	Solution

14. Vera is saving up to buy a $426 laptop. She already has $75 saved from her birthday. If she works part time at the grocery store making $9 per hour, how many hours must she work to purchase the laptop?

Inequality	Solution

15. Maggie is stocking up on chicken noodle soup for the winter season. If each can is $1.25 and she has a $2 coupon, how many cans can she buy if she can spend no more than $30?

Inequality	Solution

16. It costs the theater $750 to put on each performance. If tickets are $8 each, how many tickets must they sell for their next performance to profit at least $1,200?

Inequality	Solution

TRANSLATING & SOLVING Inequalities

	Translate	Solve
1	"Nine less than nine times a number is at least thirty-six."	$9x-9 \geq 36$ $+9 \quad +9$ $\frac{9x}{9} \geq \frac{45}{9}$ $x \geq 5$
	Inequality: $9x-9 \geq 36$	
2	"The sum of 4 and a number, divided by 2 is less than –6."	$2 \cdot \frac{4+x}{2} < -6 \cdot 2$ $4+x < -12$ $-4 \quad -4$ $x < -16$
	Inequality: $\frac{4+x}{2} < -6$	
3	"–5 plus triple a number is no more than sixteen."	$-5+3x \leq 16$ $+5 \quad +5$ $\frac{3x}{3} \leq \frac{21}{3}$ $x \leq 7$
	Inequality: $-5+3x \leq 16$	
4	"The difference of 8 and six times a number is a minimum of sixty-eight."	$8-6x \geq 68$ $-8 \quad -8$ $\frac{6x}{6} \geq \frac{60}{6}$ $x \leq 10$
	Inequality: $8-6x \geq 68$	
5	"Eight plus one fourth of a number is less than or equal to six."	$8+\frac{1}{4}x \leq 6$ $-8 \quad -8$ $4 \cdot \frac{1}{4}x \leq -2 \cdot 4$ $x \leq -8$
	Inequality: $8+\frac{1}{4}x \leq 6$	
6	"The sum of –3 and four times a number is no more than –11."	$-3+4x \leq -11$ $+3 \quad +3$ $\frac{4x}{4} \leq \frac{-8}{4}$ $x \leq -2$
	Inequality: $-3+4x \leq -11$	
7	"Half of the sum of a number and five is a maximum of ten."	$2 \cdot \frac{x+5}{2} \leq 10 \cdot 2$ $x+5 \leq 20$ $-5 \quad -5$ $x \leq 15$
	Inequality: $\frac{1}{2}(x+5) \leq 10$; $\frac{x+5}{2} \leq 10$	

TWO-STEP INEQUALITY WORD PROBLEMS

Directions: Define a variable, set up an inequality, then solve.

8 Peter spent half the money on his gift card on coffee. He loaded another $10 onto the gift card. How much was on the gift card to begin with if he now has at least $40 on the card?

let X = $ on card

$\frac{1}{2}X + 10 \geq 40$

$-10 \quad -10$

$2 \cdot \frac{1}{2}X \geq 30 \cdot 2$

$X \geq 60$

Inequality	Solution
$\frac{1}{2}X + 10 \geq 40$	$X \geq \$60$

9 Megan wants to spend no more than $300 planning a party. She spent $75 on food and wants to buy decorations that are $10 each. How many decorations can she buy?

let X = # decorations

$10X + 75 \leq 300$

$-75 \quad -75$

$\frac{10X}{10} \leq \frac{225}{10}$

$X \leq 22.5$

Inequality	Solution
$10X + 75 \leq 300$	$X \leq 22$ decorations

10 A moving truck can carry no more than 1,480 pounds of cargo. Brian loaded 640 pounds into the truck already. He is loading boxes that weigh 70 pounds. How many boxes can he put into the truck?

let X = # boxes

$640 + 70X \leq 1480$

$-640 \quad -640$

$\frac{70X}{70} \leq \frac{840}{70}$

$X \leq 12$

Inequality	Solution
$640 + 70X \leq 1480$	$X \leq 12$ boxes

11 The 7th grade class is putting on a fundraising dance. They pay $400 to rent a hall for the dance. They plan to sell tickets for $15 each. How many tickets will they need to sell if they want to raise at least $1,495?

let X = # tickets

$15X - 400 \geq 1495$

$+400 \quad +400$

$\frac{15X}{15} \geq \frac{1895}{15}$

$X \geq 126.\overline{3}$

Inequality	Solution
$15X - 400 \geq 1495$	$X \geq 127$ tickets

12 Nancy has $240 in the bank. She wants to buy as many $15 video games as possible. How many video games could she buy if she wanted to keep at least $120 in the bank?

let X = # games

$240 - 15X \geq 120$

$-240 \quad -240$

$\frac{-15X}{-15} \geq \frac{-120}{-15}$

$X \leq 8$

Inequality	Solution
$240 - 15X \geq 120$	$X \leq 8$ games

13 A taxi charges a $2.35 fee plus $0.55 per mile. Melissa has no more than $15 to spend on her taxi ride. How many miles can she go?

let X = miles

$.55X + 2.35 \leq 15$

$-2.35 \quad -2.35$

$\frac{.55X}{.55} \leq \frac{12.65}{.55}$

$X \leq 23$

Inequality	Solution
$.55X + 2.35 \leq 15$	$X \leq 23$ miles

Name: _____ **Unit 3:** Equations & Inequalities

Date: _____ **Per:** _____ **Homework 11:** Inequality Word Problems

**** This is a 2-page document! ****

Directions: For each problem, define a variable and set up an inequality, then solve.

1. "The difference between a number and 7 is greater than -23."

$x - 7 > -23$

$+7 \quad +7$

$x > -16$

Inequality	Solution
$x - 7 > -23$	$x > -16$

2. "Eight more than the quotient of a number and -5 is less than or equal to 6."

$\frac{x}{-5} + 8 \leq 6$

$-8 \quad -8$

$-5 \cdot \frac{x}{-5} \leq -2 \cdot -5$

$x \geq 10$

Inequality	Solution
$\frac{x}{-5} + 8 \leq 6$	$x \geq 10$

3. "Two-thirds of a number plus 17 is at least 29."

$\frac{2}{3}x + 17 \geq 29$

$-17 \quad -17$

$\frac{3}{2} \cdot \frac{2}{3}x \geq 12 \cdot \frac{3}{2}$

$x \geq 18$

Inequality	Solution
$\frac{2}{3}x + 17 \geq 29$	$x \geq 18$

4. "25 subtracted from the product of a number and 7 is less than -39."

$7n - 25 < -39$

$+25 \quad +25$

$\frac{7n}{7} < \frac{-14}{7}$

$n < -2$

Inequality	Solution
$7n - 25 < -39$	$n < -2$

5. "Ten minus three times a number is no more than 61."

$10 - 3x < 61$

$-10 \quad -10$

$\frac{-3x}{-3} < \frac{51}{-3}$

$x > -17$

Inequality	Solution
$10 - 3x < 61$	$x > -17$

6. "The sum of a number and 9, divided by 4, is greater than or equal to -2."

$4 \cdot \frac{x+9}{4} \geq -2 \cdot 4$

$x + 9 \geq -8$

$-9 \quad -9$

$x \geq -17$

Inequality	Solution
$\frac{x+9}{4} \geq -2$	$x \geq -17$

7. "-5 increased by one-half of a number is a maximum of 3."

$-5 + \frac{1}{2}x \leq 3$

$+5 \quad +5$

$2 \cdot \frac{1}{2}x \leq 8 \cdot 2$

$x \leq 16$

Inequality	Solution
$-5 + \frac{1}{2}x \leq 3$	$x \leq 16$

8. "14 less than twice a number is at most 50."

$2x - 14 \leq 50$

$+14 \quad +14$

$\frac{2x}{2} \leq \frac{64}{2}$

$x \leq 32$

Inequality	Solution
$2x - 14 \leq 50$	$x \leq 32$

9. Sally is going furniture shopping using her credit card. If her credit card has a limit of $2,000 and she is currently holding a balance of $763, how much can she afford to spend on furniture?

let X = $ to spend

$763 + X \leq 2000$

$-763 \quad -763$

$X \leq 1237$

Inequality	Solution
$763 + X \leq 2000$	$X \leq \$1237$

10. Connor is taking a multiple-choice test in which each question is worth 4 points. How many questions must he get correct to score at least 90 points?

let X = # questions

$\frac{4X}{4} \geq \frac{90}{4}$

$X \geq 22.5$

Inequality	Solution
$4X \geq 90$	$X \geq 23$ questions

11. Mrs. Hillard is purchasing candy hearts to distribute to the 28 students in her math class on Valentine's Day. If she would like each student to get a minimum of 15 candy hearts, how many will she need to purchase?

let X = # candies

$28 \cdot \frac{X}{28} \geq 15 \cdot 28$

$X \geq 420$

Inequality	Solution
$\frac{X}{28} \geq 15$	$X \geq 420$ candies

12. Ralph is on a diet. He currently weighs 248 pounds. How many pounds would he need to lose if he wishes to weigh at most 195 pounds?

let X = # lbs. to lose

$248 - X \leq 195$

$-248 \quad -248$

$\frac{-X}{-1} \leq \frac{-53}{-1}$

$X \geq 53$

Inequality	Solution
$248 - X \leq 195$	$X \geq 53$ lbs.

13. Blake needed at least 225 votes to become president of his seventh-grade class. If three-fourths of the seventh-grade students voted for him and he won, how many seventh-grade students could there be?

let X = # 7th graders

$\frac{4}{3} \cdot \frac{3}{4} X \geq 225 \cdot \frac{4}{3}$

$X \geq 300$

Inequality	Solution
$\frac{3}{4} X \geq 225$	$X \geq 300$ students

14. Vera is saving up to buy a $426 laptop. She already has $75 saved from her birthday. If she works part time at the grocery store making $9 per hour, how many hours must she work to purchase the laptop?

let X = # hours

$75 + 9X \geq 426$

$-75 \quad -75$

$\frac{9X}{9} \geq \frac{351}{9}$

$X \geq 39$

Inequality	Solution
$75 + 9X \geq 426$	$X \geq 39$ hours

15. Maggie is stocking up on chicken noodle soup for the winter season. If each can is $1.25 and she has a $2 coupon, how many cans can she buy if she can spend no more than $30?

let X = # cans

$1.25X - 2 \leq 30$

$+2 \quad +2$

$\frac{1.25X}{1.25} \leq \frac{32}{1.25}$

$X \leq 25.6$

Inequality	Solution
$1.25X - 2 \leq 30$	$X \leq 25$ cans

16. It costs the theater $750 to put on each performance. If tickets are $8 each, how many tickets must they sell for their next performance to profit at least $1,200?

let X = # tickets

$8X - 750 \geq 1200$

$+750 \quad +750$

$\frac{8X}{8} \geq \frac{1950}{8}$

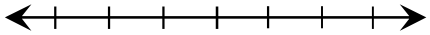
$X \geq 243.75$

Inequality	Solution
$8X - 750 \geq 1200$	$X \geq 244$ tickets

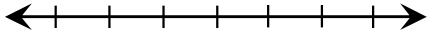
Topic 6: Writing and Graphing Inequalities

Directions: Translate each inequality. Graph your solution on the number line.

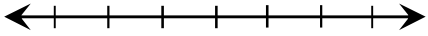
40. "A number is at least four."



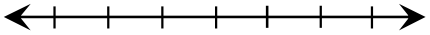
41. "Sixteen is less than a number."



42. "A number is no more than nine."



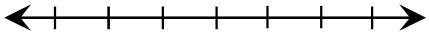
43. "A number is more than negative two."



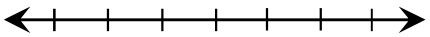
Topic 7: Solving and Graphing inequalities

Directions: Solve each inequality. Graph your solution on the number line.

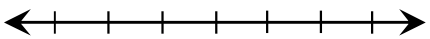
44. $k - 1 < 7$



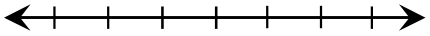
45. $-3 < p + 6$



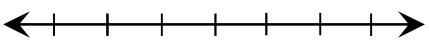
46. $8n \leq -64$



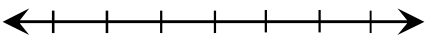
47. $5 - 9r > -13$



48. $\frac{x}{5} - 2 \geq 1$



49. $-9 \leq \frac{y}{2} - 4$



Directions: Solve each inequality. Then, check each number that is a solution.

50. $4v + 3 \leq -21$

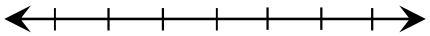
- ❑ -7
- ❑ -6
- ❑ -5
- ❑ -4
- ❑ -3

51. $-5x - 4 > -44$

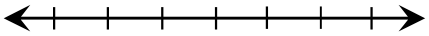
- ❑ 6
- ❑ 7
- ❑ 8
- ❑ 9
- ❑ 10

Directions: Translate each inequality. Graph your solution on the number line.

52. "Three more than twice a number is no more than eleven."



53. "The sum of two and a number, divided by three is greater than negative ten."



Topic 8: Inequality Word Problems

Directions: Define a variable and set up an inequality, then solve.

54. A shipping container can hold a maximum of 3,000 pounds of cargo. How many 150-pound boxes can go inside the container?

Inequality	Solution

55. It costs $40 to register for Karate, then $15 per lesson. If Rachel is taking lessons and wants to spend no more than $250, how many lessons can she take?

Inequality	Solution

56. Greg is saving up for a new cell phone that will cost him $550. He already has $300 saved. If would like to buy the phone in four weeks, how much must he save each week if he plans to have at least $550?

Inequality	Solution

57. Liz needs to keep no less than $500 in her checking account to avoid fees. She had $524.75 before writing a check for $65.99. How much does she need to deposit into her account to avoid a fee?

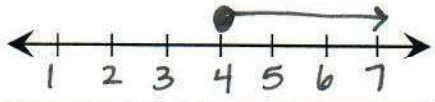
Inequality	Solution

Topic 6: Writing and Graphing Inequalities

Directions: Translate each inequality. Graph your solution on the number line.

40. "A number is at least four."

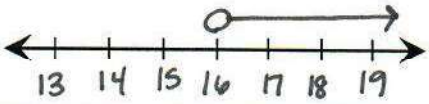
$X \geq 4$



41. "Sixteen is less than a number."

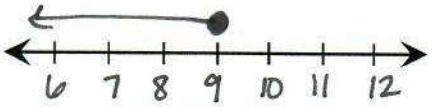
$16 < X$

$X > 16$



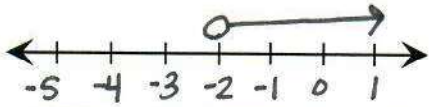
42. "A number is no more than nine."

$X \leq 9$



43. "A number is more than negative two."

$X > -2$



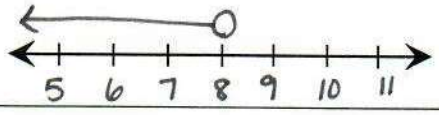
Topic 7: Solving and Graphing inequalities

Directions: Solve each inequality. Graph your solution on the number line.

44. $k - 1 < 7$

$+1 \quad +1$

$k < 8$

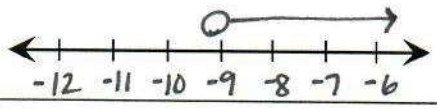


45. $-3 < p + 6$

$-6 \quad -6$

$-9 < p$

$p > -9$



46. $\frac{8n}{8} \leq \frac{-64}{8}$

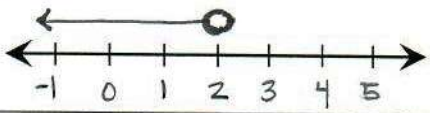
$n \leq -8$

47. $5 - 9r > -13$

$-5 \quad -5$

$\frac{-9r}{-9} > \frac{-18}{-9}$

$r < 2$

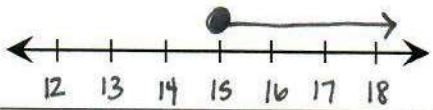


48. $\frac{x}{5} - 2 \geq 1$

$+2 \quad +2$

$5 \cdot \frac{x}{5} \geq 3 \cdot 5$

$x \geq 15$



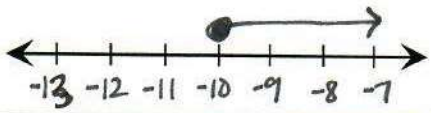
49. $-9 \leq \frac{y}{2} - 4$

$+4 \quad +4$

$2 \cdot -5 \leq \frac{y}{2} \cdot 2$

$-10 \leq y$

$y \geq -10$



Directions: Solve each inequality. Then, check each number that is a solution.

50. $4v + 3 \leq -21$

$-3 \quad -3$

$\frac{4x}{4} \leq \frac{-24}{4}$

$x \leq -6$

- [x] -7
- [x] -6
- [ ] -5
- [ ] -4
- [ ] -3

51. $-5x - 4 > -44$

$+4 \quad +4$

$\frac{-5x}{-5} > \frac{-40}{-5}$

$x < 8$

- [x] 6
- [x] 7
- [ ] 8
- [ ] 9
- [ ] 10

Directions: Translate each inequality. Graph your solution on the number line.

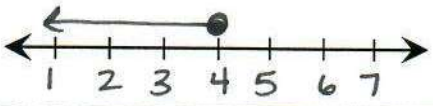
52. "Three more than twice a number is no more than eleven."

$2x + 3 \leq 11$

$-3 \quad -3$

$\frac{2x}{2} \leq \frac{8}{2}$

$x \leq 4$



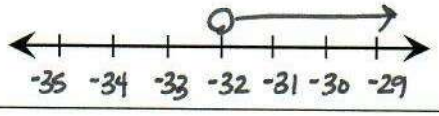
53. "The sum of two and a number, divided by three is greater than negative ten."

$3 \cdot \frac{2+x}{3} > -10 \cdot 3$

$2 + x > -30$

$-2 \quad -2$

$x > -32$



Topic 8: Inequality Word Problems

Directions: Define a variable and set up an inequality, then solve.

54. A shipping container can hold a maximum of 3,000 pounds of cargo. How many 150- pound boxes can go inside the container?

let x = # boxes

$\frac{150x}{150} \leq \frac{3000}{150}$

$x \leq 20$

Inequality	Solution
$150x \leq 3000$	$x \leq 20$ boxes

55. It costs \$40 to register for Karate, then \$15 per lesson. If Rachel is taking lessons and wants to spend no more than \$250, how many lessons can she take?

let x = # lessons

$40 + 15x \leq 250$

$-40 \quad -40$

$\frac{15x}{15} \leq \frac{210}{15}$

$x \leq 14$

Inequality	Solution
$40 + 15x \leq 250$	$x \leq 14$ lessons

56. Greg is saving up for a new cell phone that will cost him \$550. He already has \$300 saved. If would like to buy the phone in four weeks, how much must he save each week if he plans to have at least \$550?

let x = \$ per week

$300 + 4x \geq 550$

$-300 \quad -300$

$\frac{4x}{4} \geq \frac{250}{4}$

$x \geq 62.5$

Inequality	Solution
$300 + 4x \geq 550$	$x \geq \$62.50$

57. Liz needs to keep no less than \$500 in her checking account to avoid fees. She had \$524.75 before writing a check for \$65.99. How much does she need to deposit into her account to avoid a fee?

let x = \$ to deposit

$458.76 + x \geq 500$

$-458.76 \quad -458.76$

$x \geq 41.24$

Inequality	Solution
$458.76 + x \geq 500$	$x \geq \$41.24$