Inequalities Study Guide

Name: key

Identify the letter of the choice that best completes the statement or answer the question.

1. Write an inequality for the situation: ***There are more than 19 cats in the shelter.***

1. $c > 19$

2. Write an inequality for the situation: ***At least 50 pens are in the pencil-pouch.***

2. $p \geq 50$

3. What is the solution to the inequality $-2x - 40 > 8$?

$+40 \quad +40$

$\frac{-2x}{-2} > \frac{48}{-2}$

$x < -24$

3. $x < -24$

4. Which set of numbers is included in the solution set of $7 - 2x \leq -3$?

$-7 \quad -7$

$\frac{-2x}{-2} \leq \frac{-10}{-2}$ $\quad x \geq 5$

a. {2.5,8,15} b. {−8,0,1.5} c. {15,8,5.5} d. {0,2.5,8}

4. c

Write the letters on the line of the numbers that are solutions to the inequalities.

5. $5y + 5 < 20$ $\quad -5 \quad -5$

a. 0 b. 2 c. 5

$\frac{5y}{5} < \frac{15}{5}$

$y < 3$

5. a, b

6. $3p + 3 > -9$ $\quad -3 \quad -3$

a. 0 b. -2 c. -4

$\frac{3p}{3} > \frac{-12}{3}$

$p > -4$

6. a, b

Solve each inequality below and graph the solution set on the number line. Write your answer in the blank provided at the right.

7. $\frac{-7y}{-7} > \frac{28}{-7}$

$y < -4$

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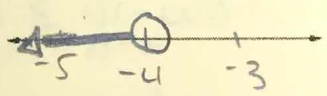


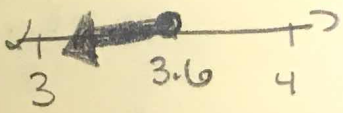
8. $3.5y + 5.7 \leq 18.2$ $\quad -5.7 \quad -5.7$

$\frac{3.5y}{3.5} \leq \frac{12.5}{3.5}$

$y \leq 3.571\ldots$

$y \leq 3.6$

8. $y \leq 3.6$



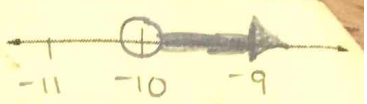
9. $\frac{z}{5} - 14 \geq -16$

$+14 \quad +14$

$(5)\frac{z}{5} > -2(5)$

$z > -10$

9. $z > -10$



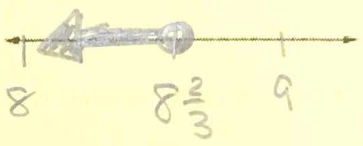
10. $-9w + 18 \geq -60$

$-18 \quad -18$

$\frac{-9w}{-9} \leq \frac{-78}{-9}$

$w \leq 8\frac{2}{3}$

10. $w \leq 8\frac{2}{3}$



11. $5(2x - 2) - 8x < -20$

$10x - 10 - 8x < -20$

$2x - 10 < -20$

$+10 \quad +10$

$\frac{2x}{2} < \frac{-10}{2}$

$x < -5$

11. $x < -5$

12. $6y + 3 - 5y \leq 8$

$y + 3 \leq 8$

$-3 \quad -3$

$y \leq 5$

12. $y \leq 5$

13. $(4)\frac{-8w - 10}{4} \geq 8(4)$

$-8w - 10 \geq 32$

$+10 \quad +10$

$\frac{-8w}{-8} \leq \frac{42}{-8}$

$w \leq -5\frac{1}{4}$

13. $w \leq -5\frac{1}{4}$

14. $24 > 3(w + 7)$

$24 > 3w + 21$

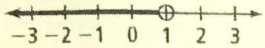
$-21 \quad -21$

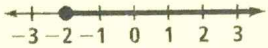
$\frac{3}{3} > \frac{3w}{3}$

$1 > w$

14. $1 > w$

Write an inequality for each graph in the blank at the right.

18. 

19. 

18. $x < 1$

19. $x \geq -2$

20. Write an inequality the models the verbal expression and solve. Show your work.

One-half of a number increased by twenty is at most forty. Find the solution set.

Inequality: $\frac{1}{2}x + 20 \leq 40$

Work:

$-20 \quad -20$

$\left(\frac{2}{1}\right)\frac{1}{2}x \leq 20\left(\frac{2}{1}\right)$

$x \leq 40$

20. $x \leq 40$

For each problem below (1) Define a variable, (2) Write an inequality that models the situation, (3) Solve the inequality showing all work, and (4) Answer the question asked in the problem. < 65

21. A local pizzeria offered a special of $8.50 per pizza. A group of students spent less than $65. They purchased three pitchers of soda for a total of $10.99 and bought some pizzas. What is the maximum number of pizzas the group purchased?

Variable: p = # of pizzas

Inequality: $8.50p + 10.99 < 65$

$-10.99 \quad -10.99$

$\frac{8.50p}{8.50} < \frac{54.01}{8.50}$

$p < 6.4$

Solution: $p < 6.4$ **Maximum number of pizzas:** 6 pizzas or less

22. The eighth grade wants to have their Promotion Ceremony at Time Warner Arena downtown. To rent the arena it costs $2500 for the first two hours and $550 for each additional hour. The students fundraised $8530. What is the maximum amount of time the students can rent the Arena?

Variable: h = # of hours

Inequality: $2500 + 550(h-2) \leq 8530$

$2500 + 550h - 1100 \leq 8530$

$1400 + 550h \leq 8530$

$-1400 \quad -1400$

$\frac{550h}{550} \leq \frac{7130}{550}$

$h \leq 12.9$

Solution: $h \leq 12.9$ **Maximum amount of time:** 12 hours

Bonus: Solve. $\frac{-3(4x-7)}{-2} > 5x - 2.2 + 17x$

$(-2)\frac{-12x+21}{-2} > 5x - 22 + 17x(-2)$

$-12x + 21 < -2(22x - 3.2)$

$-12x + 21 < -44x + 44$

$+12x \quad +44x$

$32x + 21 < 44$

$-21 \quad -21$

$\frac{32x}{32} < \frac{-16.6}{32}$

$x < -0.5$