Name Key Class _____ Date _____

1-5 Practice

Form K

Solving Inequalities

Write the inequality that represents the sentence.

1. Five less than a number is at least −28.

$x - 5 \geq -28$

2. The product of a number and four is at most −10.

$4x \leq -10$

3. Six more than a quotient of a number and three is greater than 14.

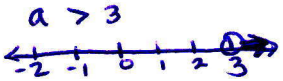
$\frac{x}{3} + 6 > 14$

Solve each inequality. Graph the solution.

4. $5a - 10 > 5$

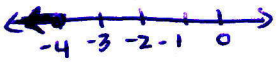
To start, add 10 to each side.

$a > 3$



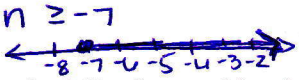
5. $25 - 2y \geq 33$

$y \leq -4$



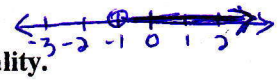
6. $-2(n + 2) + 6 \leq 16$

$n \geq -7$



7. $2(7a + 1) > 2a - 10$

$a > -1$



Solve the following problem by writing an inequality.

8. The width of a rectangle is 4 cm less than the length. The perimeter is at most 48 cm. What are the restrictions on the dimensions of the rectangle?

To start, record what you know. width: length − 4; perimeter: at most 48 cm

Describe what you need to find. restrictions on the width and length of the rectangle

The length of the rectangle is at most 14cm and the width is at most 10cm

Is the inequality *always*, *sometimes*, or *never* true?

9. $5(x - 2) \geq 2x + 1$

Sometimes

10. $2x + 8 \leq 2(x + 1)$

never

11. $6x + 1 < 3(2x - 4)$

never

12. $2(3x + 3) > 2(3x + 1)$

always

Name_____ Class _____ Date_____

1-5 Practice (continued)

Form K

Solving Inequalities

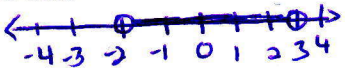
Solve each compound inequality. Graph the solution.

13. $2x > -4$ and $4x < 12$

To start, simplify each inequality. $x > -2$ and $x < 3$

Remember, "and" means that a solution makes BOTH inequalities true.

$x > -2$ and $x < 3$ $\quad -2 < x < 3$

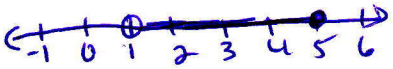


14. $3x \geq -12$ and $5x \leq 5$

$x \geq -4$ and $x \leq 1$ $\quad -4 \leq x \leq 1$

15. $6x > 6$ and $9x \leq 45$

$x > 1$ and $x \leq 5$ $\quad 1 < x \leq 5$



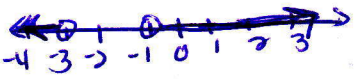
Solve each compound inequality. Graph the solution.

16. $3x < -9$ or $8x > -8$

To start, simplify each inequality. $x < -3$ or $x > -1$

Remember, "or" means that a solution makes EITHER inequality true.

$x < -3$ or $x > -1$



17. $7x \leq -28$ or $2x > -2$

$x \leq -4$ or $x > -1$

18. $3x > 3$ or $5x < 2x - 3$

$x > 1$ or $x < -1$

Write an inequality to represent each sentence.

19. The average of Shondra's test scores in Physics is between 88 and 93.

Let x = Shondra's test score average $\quad 88 < x < 93$

20. The Morgans are buying a new house. They want to buy either a house more the 75 years old or a house less than 10 years old.

Let x = age of house

$x < 10$ or $x > 75$

4.

$$\begin{array}{r|c|l} 5a-10 & > & 5 \\ +10 & & +10 \\ \hline \frac{5a}{5} & > & \frac{15}{5} \\ a & > & 3 \end{array}$$

5.

$$\begin{array}{r|c|l} 25-2y & \geq & 33 \\ -25 & & -25 \\ \hline -2y & \geq & 8 \\ \hline -2 & & -2 \\ y & \leq & -4 \end{array}$$

6.

$$\begin{array}{r|c|l} -2(n+2)+6 & \leq & 16 \\ -2n-4+6 & \leq & 16 \\ -2n+2 & \leq & 16 \\ -2 & & -2 \\ \hline -2n & \leq & 14 \\ \hline -2 & & -2 \\ n & \geq & -7 \end{array}$$

7.

$$\begin{array}{r|c|l} 2(7a+1) & > & 2a-10 \\ 14a+2 & > & 2a-10 \\ -2a & & -2a \\ \hline 12a+2 & > & -10 \\ -2 & & -2 \\ \hline 12a & > & -12 \\ \hline 12 & & 12 \\ a & > & -1 \end{array}$$

8. Let x = length of rectangle

then $x-4$ = width of rectangle

$$\begin{array}{r|c|l} 2(x)+2(x-4) & \leq & 48 \\ 2x+2x-8 & \leq & 48 \\ 4x-8 & \leq & 48 \\ +8 & & +8 \\ \hline \frac{4x}{4} & \leq & \frac{56}{4} \\ x & \leq & 14 \end{array}$$

9.
$$\begin{array}{r|c|l} 5(x-2) & \geq & 2x+1 \\ 5x-10 & \geq & 2x+1 \\ -2x & & -2x \\ \hline 3x-10 & \geq & 1 \\ +10 & & +10 \\ \hline \frac{3x}{3} & \geq & \frac{11}{3} \\ x & \geq & \frac{11}{3} \end{array}$$

10.
$$\begin{array}{r|c|l} 2x+8 & \leq & 2(x+1) \\ 2x+8 & \leq & 2x+2 \\ -2x & & -2x \\ \hline 8 & \leq & 2 \end{array}$$

11.
$$\begin{array}{r|c|l} 6x+1 & < & 3(2x-4) \\ 6x+1 & & 6x-12 \\ -6x & & -6x \\ \hline 1 & < & -12 \end{array}$$

12.
$$\begin{array}{r|c|l} 2(3x+3) & > & 2(3x+1) \\ 6x+6 & > & 6x+2 \\ -6x & & -6x \\ \hline 6 & > & 2 \end{array}$$

13.
$$\begin{array}{r|c|l} \frac{2x}{2} & > & \frac{-4}{2} \\ x & > & -2 \end{array} \quad \text{and} \quad \begin{array}{r|c|l} \frac{4x}{4} & < & \frac{12}{4} \\ x & < & 3 \end{array}$$

14.
$$\begin{array}{r|c|l} \frac{3x}{3} & \geq & \frac{-12}{3} \\ x & \geq & -4 \end{array} \quad \text{and} \quad \begin{array}{r|c|l} \frac{5x}{5} & \leq & \frac{5}{5} \\ x & \leq & 1 \end{array}$$

15.
$$\begin{array}{r|c|l} \frac{6x}{6} & > & \frac{6}{6} \\ x & > & 1 \end{array} \quad \text{and} \quad \begin{array}{r|c|l} \frac{9x}{9} & \leq & \frac{45}{9} \\ x & \leq & 5 \end{array}$$

16.
$$\begin{array}{r|c|l} \frac{3x}{3} & < & \frac{-9}{3} \\ x & < & -3 \end{array} \quad \text{or} \quad \begin{array}{r|c|l} \frac{8x}{8} & > & \frac{-8}{8} \\ x & > & -1 \end{array}$$

17.
$$\begin{array}{r|c|l} \frac{7x}{7} & \leq & \frac{-28}{7} \\ x & \leq & -4 \end{array} \quad \text{or} \quad \begin{array}{r|c|l} \frac{2x}{2} & > & \frac{-2}{2} \\ x & > & -1 \end{array}$$

18.
$$\begin{array}{r|c|l} \frac{3x}{3} & > & \frac{3}{3} \\ x & > & 1 \end{array} \quad \text{or} \quad \begin{array}{r|c|l} 5x & < & 2x-3 \\ -2x & & -2x \\ \hline \frac{3x}{3} & < & \frac{-3}{3} \\ x & < & -1 \end{array}$$