

WARM UP

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1) $15 \cdot 4k = -11$

3) $\frac{r+4}{3} = -5$

2) $\frac{2}{5}k - 16 = -22$

4) $3x + 7 = 13$

inequality - a mathematical sentence that states that two expressions are NOT equal

inequality symbol - symbol used to compare both sides of an inequality $<$, $>$, \leq , \geq

solution set - a list of values that make an inequality true $\{x, y, z \dots\}$

Translating inequality word phrases

Algebraic Phrase	Algebraic Inequality	Solutions
1. a number is less than 4.	$x < 4$	{3, 2, 1...}
2. a number is more than 4.	$x > 4$	{5, 6, 7...}
3. -4 is less than a number.	$-4 < x$	{-3, -4, -5...}
4. -4 is greater than a number.	$-4 > x$	{-5, -6, -7...}
5. Jason has at least five dollars.	$d \geq 5$	{5, 6, 7...}
6. The highest grade you can get is a ninety-five.	$g \leq 95$	{95, 94, 93...}

EXAMPLE:

1) DRAW your RIVER (a line to separate left-side from the right-side.)

2) Perform inverse (or opposite) operation.

3) Box your final answer.

$$x + 8 < 21$$

$$\boxed{x} + 8 < 21$$

$$\boxed{x} + 8 < 21$$

$$- 8 < - 8$$

$$\boxed{x < 13}$$

$$3x \leq 21$$

$$3x \leq 21$$

$$\underline{3x} \leq \underline{21}$$

$$3 \leq 3$$

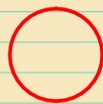
$$\boxed{x \leq 7}$$

****ALWAYS CHECK****
Does my answer make sense?

graph of an inequality - a number line that shows the solution to an inequality, since there are infinite solutions

Two steps:

1. choose open or closed circle at first point of solution

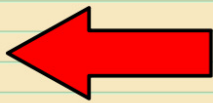


$$\begin{aligned} X < \# \\ X > \# \end{aligned}$$



$$\begin{aligned} X \leq \# \\ X \geq \# \end{aligned}$$

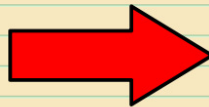
2. choose to shade left or right



$$X < \#$$

OR

$$\# > X$$



$$X > \#$$

OR

$$\# < X$$

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1) $-6m + 2 < -10$

2) $9 - x > 11$

3) Write the solution set for problems 1 and 2.

4) Write an inequality to represent the scenario:
An elevator can hold no more than 18 people.

5) Write an inequality to represent the scenario:
There are at least 42 students on our team
would made the honor roll last quarter.

When multiplying or dividing by a negative, switch the inequality symbol to its opposite.

EXAMPLE:

$$-3x \geq 21$$

$$\frac{-3x}{-3} \geq \frac{21}{-3}$$

$$x \leq -7$$

CHECK:if $x = -5$

$$\begin{aligned} -3(-5) &\geq 21 \\ 15 &\geq 21 \quad \times \end{aligned}$$

if $x = -9$

$$\begin{aligned} -3(-9) &\geq 21 \\ 27 &\geq 21 \quad \checkmark \end{aligned}$$

EXAMPLE:

$$8 - x > 20$$

$$\begin{aligned} 8 - x &> 20 \\ \frac{-8}{-1} - x &\frac{-8}{-1} > \frac{20}{-1} \\ -x &> 12 \\ \frac{-x}{-1} &\frac{-1}{-1} > \frac{12}{-1} \end{aligned}$$

$$x < -12$$

Solution Set:

$$\{-13, -14, -15, \dots\}$$

Solution Set:

$$\{-7, -8, -9, \dots\}$$

Solve and Graph each Inequality

Ex 1) $4x + 6 < 12$

Solve and Graph each Inequality

Ex 2) $2x - 3 - 8x \geq 21$

Solve and Graph each Inequality

Ex 3) $7(2x - 4) - 12x > -12$

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1) Emily divided 4 dozen roses into two baskets. The first had $(x + 10)$ and the second had $(2x - 1)$. How many roses were in each basket?

2) If $F = \frac{9}{5}C + 32$, what is 65°F in $^{\circ}\text{C}$?

3) $-x - 17 \leq 1$

4) $4x + 9 > 13$

5) Draw a graph of the solution for problem 4.

SOLVE

GRAPH

$$0.5X + 40 < 50$$



$$10 - 1.5X \geq 20$$



$$\frac{X}{2} + 2.6 > 8.1$$



WARM UP

1) Emily divided one more than 2 dozen roses into two baskets. The first had $(x - 1)$ and the second had $(2x + 2)$. How many roses were in each basket?

2) If $F = \frac{9}{5}C + 32$, what is 105°F in $^{\circ}\text{C}$?

3) $-x + 26 \geq 30$

4) $5x - 17 < 3$

5) Draw a graph of the solution for problem 4.

Your school wants to raise at least \$2,000 for the Pennies for Patients Campaign. How much should each student contribute if there are 32 classes with 25 students in each class?

- A) Write the inequality**
- B) Solve**
- C) Write the solution set**
- D) Graph**



Problem solving:

Online concert tickets cost \$38.95 each, plus a service charge of \$2.55 per ticket. The website also charges a transaction fee of \$12.99 for the purchase. If you paid \$332, how many tickets did you buy?

A) Write a multi-step equation

B) Solve



Problem solving:

Calvin bought 3 pairs of jeans for \$21 each and 2 shirts. He spent a total of \$82 before tax. What was the cost of 1 shirt?

A) Write a multi-step equation

B) Solve



Elvin bought 3 shirts for \$19 each and 2 pair of jeans . He didn't want to spend more than \$68 before tax. What was the cost of one pair of jeans?

A) Write the inequality

B) Solve

C) Write the solution set

D) Graph