Grab a worksheet from the front desk and Warm Up on the solving equations problems at the top of the worksheet! Have homework out ready to check.

Classwork - Solving Inequalities

Warm Up: Solve the following equations.

A) $6x + 10 = 46$

$-10 \quad -10$

$\frac{6x}{6} = \frac{36}{6}$

$x = 6$

B) $\frac{x}{4} - 5 = 3$

$+5 \quad +5$

$4 \cdot \frac{x}{4} = 8 \cdot 4$

$x = 32$

C) $-3(2x - 5) + 2x = 29$

$-6x + 15 + 2x = 29$

$-4x + 15 = 29$

$-15 \quad -15$

$-4x = 14$

$\frac{-4x}{-4} = \frac{14}{-4}$

$x = -3.5$

Translate each sentence into an equation and solve.

1) Three more than eight times a number is equal to 19.

$8n + 3 = 19$

$-3 \quad -3$

$\frac{8n}{8} = \frac{16}{8}$

$n = 2$

2) Twelve less than seven times a number is 16.

$7n - 12 = 16$

$+12 \quad +12$

$\frac{7n}{7} = \frac{28}{7}$

$n = 4$

Define a variable. Then write and solve an equation to solve each problem.

3) Yoshi bought a canvas and 8 tubes of paint for $24.95. If the canvas cost $6.95, how much did each tube of paint cost?

Define variable: C = Cost of tube of paint

Equation

$8C + 6.95 = 24.95$

$-6.95 \quad -6.95$

$\frac{8C}{8} = \frac{18}{8}$

$C = \$2.25$

4) The world's two highest dams are both in Tajikistan. The Rogun dam is 35 meters taller than the Nurek dam. Together they are 635 meters tall. Find the height of the Nurek dam.

Define variable: h = height of Nurek Dam

Equation

$h(h+35)=635$

$2h+35=635$

$-35 \quad -35$

$\frac{2h}{2}=\frac{600}{2}$

$h = 300m$

5) A rectangle has a width of 6 inches and a perimeter of 26 inches. What is the length of the rectangle?

Define variable: l = length of rectangle

$l+l+w+w=P$

Equation

$l+l+6+6=26$

$2l+12=26$

$-12 \quad -12$

$\frac{2l}{2}=\frac{14}{2}$

$l = 7$ inches

6) At the market, Meyer buys a bunch of bananas for $0.65 per pound and a frozen pizza for $4.99. The total for his purchase was $6.94, without tax. How many pounds of bananas did Meyer buy?

Define variable: x = # of pounds of bananas

Equation

$0.65x + 4.99 = 6.94$

$-4.99 \quad -4.99$

$0.65x = 1.95$

$\frac{0.65x}{0.65} = \frac{1.95}{0.65}$

$x = 3$ pounds

7) Ella swims four times a week at her club's pool. She swims the same number of laps on Monday, Wednesday, and Friday, and 15 laps on Saturday. She swims a total of 51 laps each week. How many laps does she swim on Monday?

Define variable: n = number of laps on Monday

Equation

$n + n + n + 15 = 51$

$3n + 15 = 51$

$-15 \quad -15$

$\frac{3n}{3} = \frac{36}{3}$

$n = 12$ laps

8) While at the music store, Drew bought 5 CDs, all at the same price. The tax on his purchase was $6, and the total was $61. What was the price of each CD?

Define variable: p = price of CD

Equation

$5x + 6 = 61$

$-6 \quad -6$

$\frac{5x}{5} = \frac{55}{5}$

$x = \$11$

9)Laura is making a patio in her backyard using paving stones. She buys 44 paving stones and a flowerpot worth $7 for a total of $73. How much did each paving stone cost?

Define variable: c = cost of each stone

Equation

$44c + 7 = 73$

$-7 \quad -7$

$\frac{44c}{44} = \frac{66}{44}$

$c = \$1.50$

10) A taxi service charges you $1.50 plus $0.60 per minute for a trip to the airport. The distance to the airport is 10 miles, and the total charge is $13.50. How many minutes did the ride to the airport take?

Define variable: m = # of minutes

Equation

$0.6m + 1.50 = 13.50$

$-1.50 \quad -1.50$

$\frac{0.6m}{0.6} = \frac{12}{0.6}$

$m = 20$ minutes

Graphing Inequalities

Inequality Signs

$>$ → greater than

$<$ → less than

$\geq$ → greater than or equal

$\leq$ → less than or equal

When graphing an inequality on a number line there are two parts.

1) Circle (open or closed)

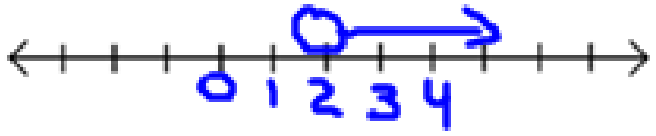
Open → $>$ or $<$

Closed → $\geq$ or $\leq$

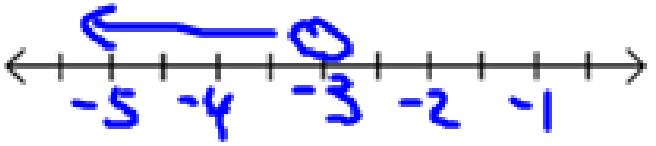
2) Arrow drawn towards the direction of possible answers

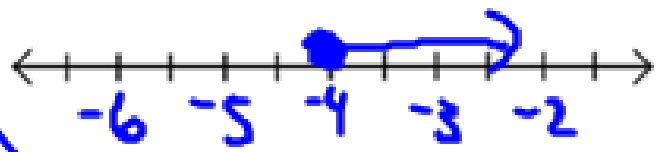
Graph the following inequalities to show what values x could possibly be. **Show at least 5 #s on the number line.**

$x > 2$



$x < -3$

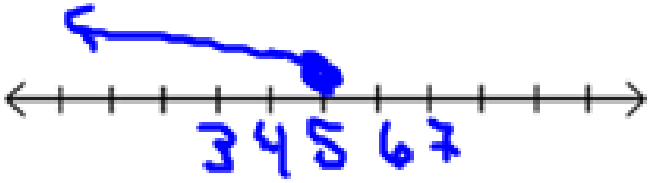




$-4 \leq x$

$x \geq -4$

$5 \geq x$



Solving Inequalities

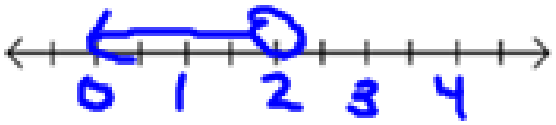
Solving inequalities very similar to solving equations. The main difference is that instead finding one solution, we are finding all possible solutions.

A) $2x + 8 < 12$

$-8 \quad -8$

$\frac{2x}{2} < \frac{4}{2}$

$x < 2$

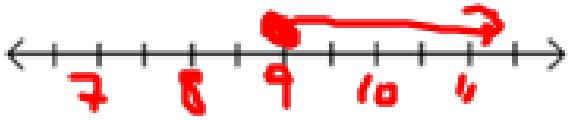


B) $\frac{x}{9} - 3 \geq -2$

$+3 \quad +3$

$9 \cdot \frac{x}{9} \geq 1 \cdot 9$

$x \geq 9$



C) $-4x - 5x > 36$

$-9x > 36$

$\frac{-9}{-9} \quad \frac{x}{-9}$

$x < -9$

*Flip the sign when ÷/x by a negative

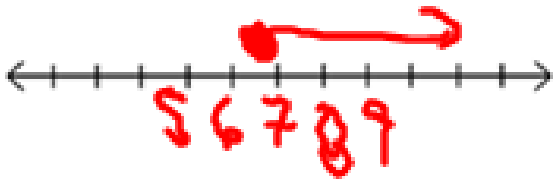
D) $9 \leq 3x - 12$

$+12 \quad +12$

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

$7 \leq x$

$x \geq 7$



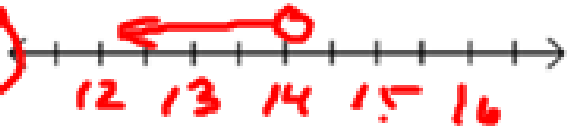
E) $1.5x - 6 < 15$

$+6 \quad +6$

$1.5x < 21$

$\frac{1.5x}{1.5} < \frac{21}{1.5}$

$x < 14$

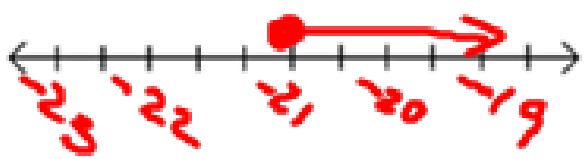


F) $\frac{x}{3} + 5 \geq -2$

$-5 \quad -5$

$3 \cdot \frac{x}{3} \geq -7 \cdot 3$

$x \geq -21$



G) $21 < 3(2x - 5)$

$21 < 6x - 15$

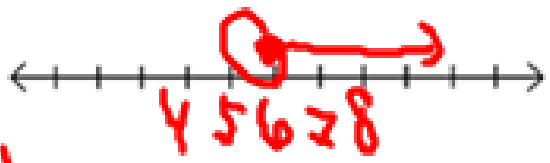
$+15 \quad +15$

$\frac{36}{6} < \frac{6x}{6}$

$6 < x$

OR

$x > 6$



H) $-\frac{1}{4}(x + 16) \leq 5$

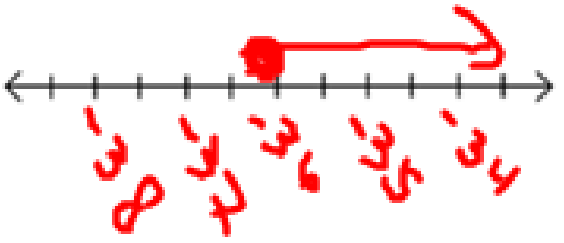
$-\frac{1x}{4} - 4 \leq 5$

$+4 \quad +4$

$\frac{-1x}{4} \leq 9 \cdot 4$

$\frac{-1x}{-1} \geq \frac{36}{-1}$

$x \geq -36$



I) $3(4x+2)-4x \leq 38$

J) $2(5x-2)+3(-x+4) > -55$

Write an inequality to represent the situation. Then solve and graph the inequality. Interpret your solution.

A) Katie is starting a cleaning business. She spent $63 to make signs to advertise. She charges an initial fee of $8 and then $11 for each hour of service. How many hours will she need to clean to make a profit?

Define variable: h = # of hours

Inequality $11h + 8 > 63$

B) A rental car company charges $35 plus $0.16 per mile to rent a car. Mr. Willimann does not want to spend more than $115 for his rental car. How many miles can Mr. Willimann drive in the rental car?

Define variable: ____ = _____

Inequality