

1-10-18

Aim: SWBAT solve and graph inequalities.

HW: Packet Pages 14 - 15

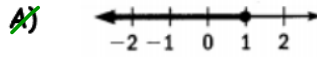
Inequalities Quiz Friday

Do Now: Correct Page 5 HW

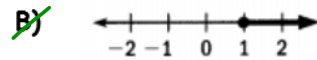
Homework

Match the inequality with its graph:

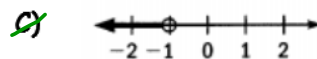
1) $x < -1$ C



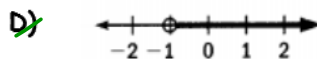
2) $x \leq 1$ A



3) $x \geq 1$ B

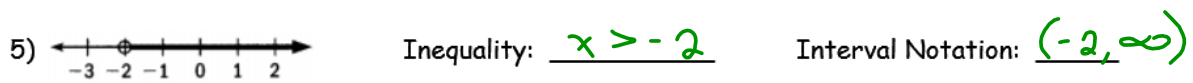


4) $x > -1$ D

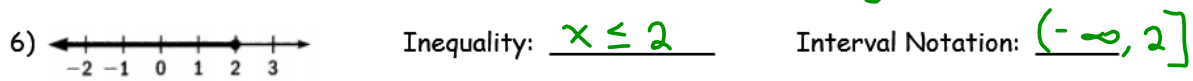


Write the inequality and the verbal phrase represent by each graph.

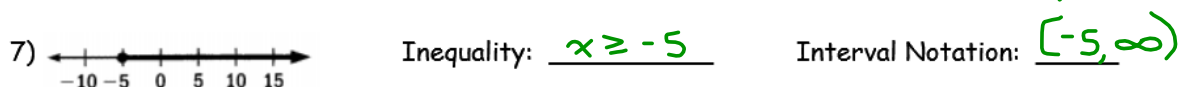
Represent each inequality in interval notation.



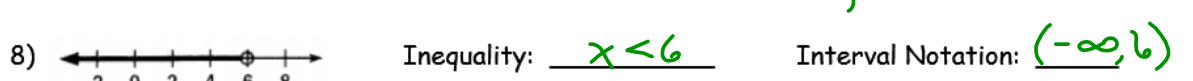
Verbal Phrase: All real numbers greater than -2.



Verbal Phrase: All real numbers less than or equal to 2.

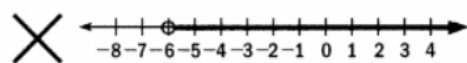


Verbal Phrase: All real numbers greater than or equal to -5.



Verbal Phrase: All real numbers less than 6.

9) Describe and correct the error in graphing $x \geq -6$.



The circle should be closed.

10) Are the inequalities $x < 12$ and $12 > x$ equivalent? Explain.

Yes. They have the same solution set.

11) The frequency, f , of the human singing voice is at least 81 hertz and not more than 1100 hertz. Which statement is NOT true about f ? $81 \leq f \leq 1100$

A) $f \geq 81$

B) $f \leq 1100$

C) $81 \leq f$

D) $f \geq 1100$

HW: Inequalities

Circle TRUE or FALSE for each of the following.

1. $x + 3 \geq 9$, if $x = 6$
 $6 + 3 \geq 9$

TRUE

FALSE

2. $7 - x < -4$, if $x = -11$
 $7 - (-11) < -4$
 $18 < -4$

TRUE

FALSE

3. $13 < -3x + 1$, if $x = -4$
 $13 < (-3)(-4) + 1$
 $13 < 12 + 1$
 $13 < 13$

TRUE

FALSE

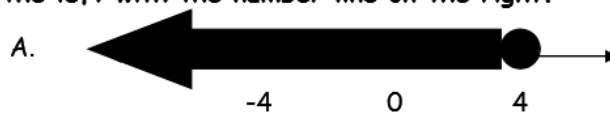
4. $3(x - 4) > -21$, if $x = -3$
 $3(-3 - 4) > -21$
 $3(-7) > -21$
 $-21 > -21$

TRUE

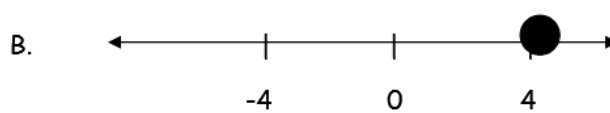
FALSE

Match the equation or inequality on the left with the number line on the right.

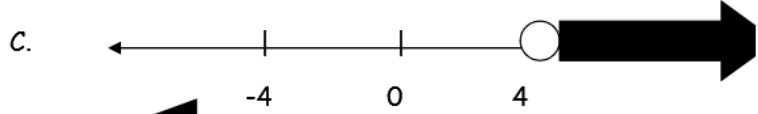
A 5. $x \leq 4$



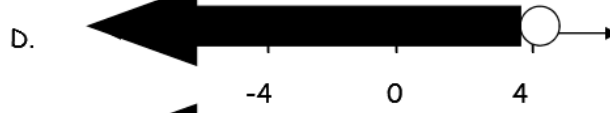
C 6. $x > 4$



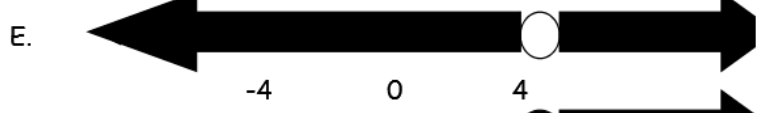
E 7. $x \neq 4$



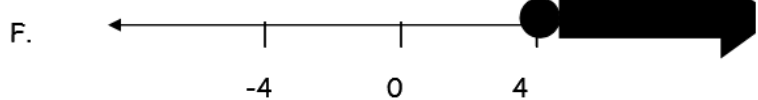
F 8. $4 \leq x$
 $x \geq 4$



B 9. $4 = x$



D 10. $x < 4$



Solve the following inequalities. Represent each solution using interval notation.

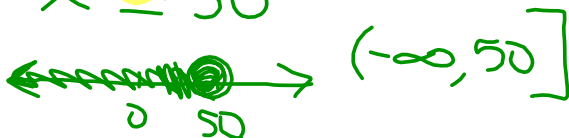
11) $\frac{4x}{4} > \frac{-2.4}{4}$
 $x > -0.6$
 $(-0.6, \infty)$

12) $x + 9\frac{1}{6} < 4\frac{5}{9}$
 $\frac{-9\frac{1}{6}}{1} - \frac{9\frac{1}{6}}{1}$
 $x < -4\frac{11}{18}$
 $(-\infty, -4\frac{11}{18})$

$$13) \quad -0.7x \geq -35$$

$$\frac{-0.7x}{-0.7} \geq \frac{-35}{-0.7}$$

$$x \leq 50$$



$$14) \quad -\frac{2}{5}x \leq 10$$

$$\frac{-\frac{2}{5}x}{-\frac{2}{5}} \leq 10 \cdot \frac{-5}{2}$$

$$x \geq -25$$



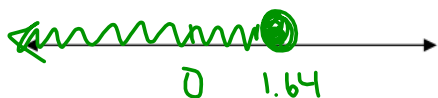
Solve and **GRAPH** the solution to the following inequalities.

$$15) \quad -1.2 + 4x \leq 5.36$$

$$\frac{-1.2 + 4x}{+1.2} \leq \frac{5.36}{+1.2}$$

$$\frac{4x}{4} \leq \frac{6.56}{4}$$

$$x \leq 1.64$$



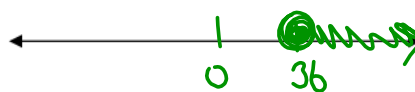
$$16) \quad \frac{2}{3}(6+x) \geq 28$$

$$\frac{2}{3} \cdot \frac{3}{2} (6+x) \geq 28 \cdot \frac{3}{2}$$

$$6+x \geq 42$$

$$\frac{6+x}{-6} \geq \frac{42}{-6}$$

$$x \geq 36$$

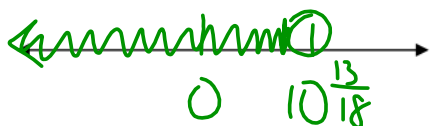


$$17) \quad -5\frac{7}{8} + \frac{3}{4}x < 2\frac{1}{6}$$

$$\frac{-5\frac{7}{8} + \frac{3}{4}x}{+5\frac{7}{8}} < \frac{2\frac{1}{6}}{+5\frac{7}{8}}$$

$$\frac{\frac{3}{4}x}{\frac{3}{4}} < 8\frac{1}{24} \cdot \frac{4}{3}$$

$$x < 10\frac{13}{18}$$

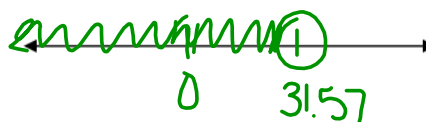


$$18) \quad 12.65 + \frac{x}{7} > 8.14$$

$$\frac{12.65 + \frac{x}{7}}{-12.65} > \frac{8.14}{-12.65}$$

$$\frac{\frac{x}{7}}{-7} > -4.51 \cdot \frac{-7}{1}$$

$$x < 31.57$$



AIM: SWBAT solve and graph multi-step inequalities.

DO NOW: Solve and graph your solution on a number line.

1) $\frac{1}{4}z - 5 \leq -\frac{1}{5}z$

$$\begin{array}{r} -\frac{1}{4}z \quad -\frac{1}{4}z \\ \hline -\frac{20}{9} \cdot -5 \leq -\frac{9}{20}z \cdot -\frac{20}{9} \\ 11\frac{1}{9} \geq z \end{array}$$

2) $\frac{4}{11}c - \frac{5}{13}c < 3$

$$\begin{array}{r} -\frac{143}{3} \cdot -\frac{3}{143}c < 3 \cdot -\frac{143}{3} \\ c > -143 \end{array}$$

Solving Multi-step Inequalities

Goal: Get variable by itself. Get variable terms on one side and constant terms on the opposite side. Use opposite operations!

OR

When solving multi-step equations we can use PEMDAS BACKWARDS to help us decide which operation to undo first.

When solving multi-step inequalities we do the same thing. Use PEMDAS BACKWARDS!

EXAMPLE:

$$\begin{array}{r} 5n - 3n - 5 > 17 \quad (\text{Simplify First!}) \\ 2n - 5 > 17 \quad (\text{undo addition/subtraction before multiplication/division}) \\ \underline{+5 \quad +5} \\ 2n > 22 \\ \underline{2 \quad 2} \\ n > 11 \end{array}$$

Remember: To check the equality you must choose ANY number greater than 11.

Check:

- 1) $5n - 3n - 5 > 17$?
- 2) $5(20) - 3(20) - 5 > 17$
- 3) $100 - 60 - 5 > 17$
- 4) $35 > 17$

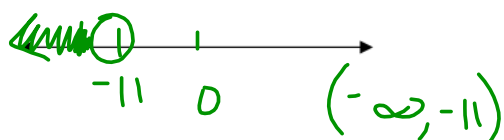
TRUE

Practice Problems. Solve and graph your solution on a number line.

Use interval notation to represent your solution.

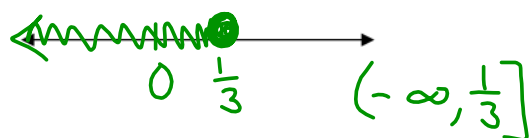
1) $9b - 3b + 34 < 2b - 10$

$$\begin{array}{r} 6b + 34 < 2b - 10 \\ -2b \quad -2b \\ \hline 4b + 34 < -10 \\ -34 \quad -34 \\ \hline 4b < -44 \\ \frac{4b}{4} < \frac{-44}{4} \\ b < -11 \end{array}$$



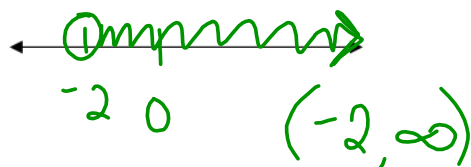
2) $10(1.2c + 1.2) \geq 10(5.2c - 0.4c)$

$$\begin{array}{r} 12c + 12 \geq 52c - 4c \\ 12c + 12 \geq 48c \\ -12c \quad -12c \\ \hline 12 \geq 36c \\ \frac{12}{36} \geq \frac{36c}{36} \\ \frac{1}{3} \geq c \end{array}$$



3) $\frac{10a}{-5} > \frac{-5(a+6)}{-5}$

$$\begin{array}{r} -2a < a + 6 \\ -a \quad -a \\ \hline 3a < 6 \\ \frac{3a}{3} < \frac{6}{3} \\ a > -2 \end{array}$$

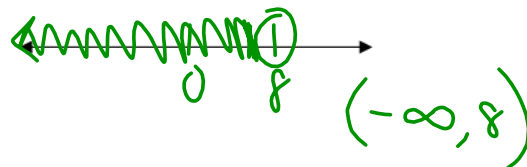


$10a > -5(a+6)$ 4)

$$\begin{array}{r} 10a > 5a - 30 \\ +5a \quad +5a \\ \hline 15a > -30 \\ \frac{15a}{15} > \frac{-30}{15} \\ a > -2 \end{array}$$

$9(c-3) < 29 + 2c$

$$\begin{array}{r} 9c - 27 < 29 + 2c \\ -2c \quad -2c \\ \hline 7c - 27 < 29 \\ +27 \quad +27 \\ \hline 7c < 56 \\ \frac{7c}{7} < \frac{56}{7} \\ c < 8 \end{array}$$



Homework - Solving Multi-Step Inequalities

Solve each inequality and graph your solution on a number line. Use interval notation to represent the solution

1) $2(5 + n) \leq 6$

2) $5 - 4z > 17 - z$



3) $2(5x - 4) \leq 8(x + 1)$

4) $\frac{1}{3}m - \frac{1}{2}m > -4$



5) $3.7z \leq 33.32 - 3.1z$

6) $-0.6y - 3.79 < 5.2y + 19.67$



7) $4(6k - 4) \geq 7k - (2k - 3)$

8) $2.3x - 52.46 > -0.9(x - 117)$

