Lesson #16

Solving inequalities step by step

Individual Practice

Firstly, during yesterday's video of lesson #15, Grace found a mistake! I forgot the x on the right side of the inequality. Here is the correction :

p.56 in your notebooks, question g

$$x + x - 4 > 8 + x, \ x \ \epsilon \ R$$

$$2x - 4 \ > 8 + x$$

$$-x \qquad\quad -x$$

$$x - 4 \ > 8$$

$$+4 \quad +4$$

$$x \ > 12$$

Today, there are 16 inequalities below that you are going to solve. Please make sure to show all your work. When you have finished, correct your answers with mine.

Lesson #16

Solve the following inequalities on looseleaf. Label this page 57 for your notebooks.

Remember: 1. Copy the inequality.
2. Show all your work.
3. keep your $>, <, \geq$ or $\leq$ in a nice straight line.
4. Circle your final answer
5. Draw your solution set on a number line.

This is what I want to see for every question

ex.
$$2(x-4)+6 > (x-2)+5, \; x \in R$$
$$2x-8+6 > x-2+3$$
$$2x-2 \quad > x+3$$
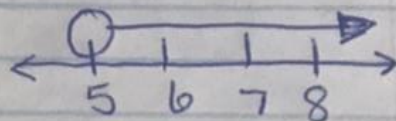$$\underline{-x} \qquad \underline{-x}$$
$$x-2 > 3$$
$$\underline{+2} \qquad \underline{+2}$$
$$\boxed{x > 5}$$

* When you have finished, correct your answers with mine.

QUESTIONS:

a) $x + 2 < 6, x \in R$

b) $x - 3 \leq 4, x \in R$

c) $2x > -12, x \in R$
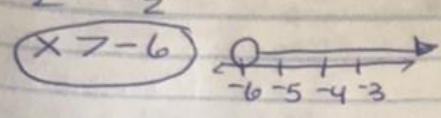
d) $\frac{x}{5} > 6, x \in Z$

e) $-3a + 5a \leq 4, x \in R$

f) $4c + 3c + 7 \leq 21, x \in R$
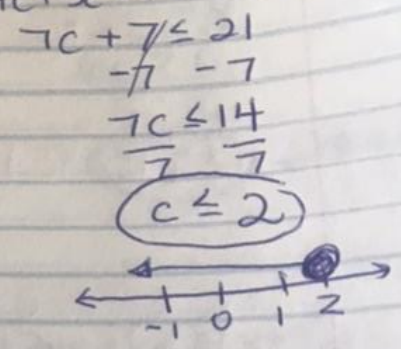
g) $3a > a + 4, a \in Z$

h) $7v - 4v > v - 10, v \in R$

i) $5a + 3a \leq 4a - 2, a \in R$

j) $7c - 4c \leq c + 6, c \in R$

k) $2(a+1) > 4, a \in R$

l) $2(3c+4) > 14, c \in Z$

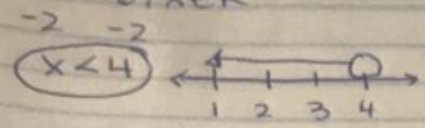m) $2(x+1) \leq (x-2) + 1, x \in R$

n) $5(2x-3) < 2(x+7) + 11, x \in R$

o) $\frac{n}{5} - 4 > -8, n \in R$

p) $\frac{c}{2} \leq \frac{c}{3} - 1, c \in R$

SOLUTIONS

a) $x + 2 < 6, x \in R$

$-2 \quad -2$

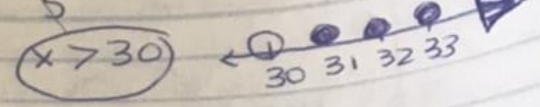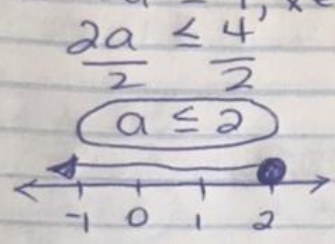$\boxed{x < 4}$

b) $x - 3 \leq 4, x \in R$

$+3 \quad +3$

$\boxed{x \leq 7}$

c) $\dfrac{2x}{2} > \dfrac{-12}{2}, x \in R$

$\boxed{x > -6}$

d) $\dfrac{x}{5} \times 5 > 6 \times 5, x \in Z$

$\boxed{x > 30}$

e) $-3a + 5a \leq 4, x \in R$

$\dfrac{2a}{2} \leq \dfrac{4}{2}$

$\boxed{a \leq 2}$

f) $4c + 3c + 7 \leq 21, c \in R$

$7c + 7 \leq 21$

$-7 \quad -7$

$\dfrac{7c}{7} \leq \dfrac{14}{7}$

$\boxed{c \leq 2}$

g) $3a > a + 4, a \in Z$

$-a \quad -a$

$\dfrac{2a}{2} > \dfrac{4}{2}$

$\boxed{a > 2}$

h) $7v - 4v > v - 10, v \in R$

$3v > v - 10$

$-v \quad -v$

$\dfrac{2v}{2} > \dfrac{-10}{2}$

$\boxed{v > -5}$
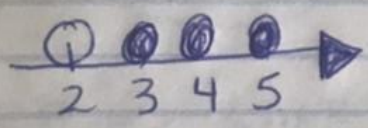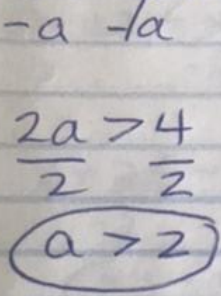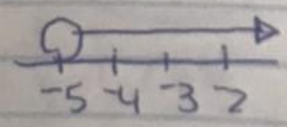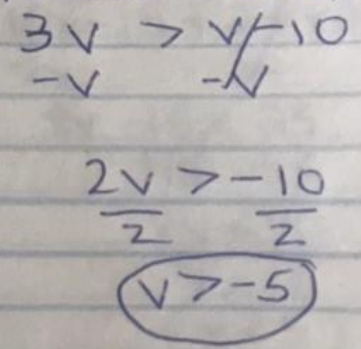
i) $5a + 3a \leq 4a - 2$, $a \in R$
$8a \leq 4a - 2$
$-4a \quad -4a$

$\dfrac{4a}{4} \leq \dfrac{-2}{4}$

$\boxed{a \leq -0.5}$

number line: $-2 \; -1.5 \; -1 \; -0.5$
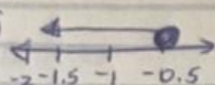
j) $7c - 4c \leq c + 6$, $c \in R$
$3c \leq c + 6$
$-c \quad -c$

$\dfrac{2c}{2} \leq \dfrac{6}{2}$

$c \leq 3$

number line: $0 \; 1 \; 2 \; 3$
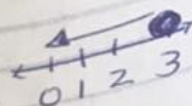
k) $2(a+1) > 4$, $a \in R$
$2a + 2 > 4$
$-2 \quad -2$

$\dfrac{2a}{2} > \dfrac{2}{2}$

$\boxed{a > 1}$

number line: $1 \; 2 \; 3 \; 4$
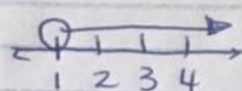
l) $2(3c+4) > 14$, $c \in Z$
$6c + 8 > 14$
$-8 \quad -8$

$\dfrac{6c}{6} > \dfrac{6}{6}$

$\boxed{c > 1}$

number line: $1 \; 2 \; 3 \; 4$
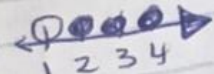
m) $2(x+1) \leq (x-2) + 1$, $x \in R$
$2x + 2 \leq x - 2 + 1$
$2x + 2 \leq x - 1$
$-x \quad -x$

$x + 2 \leq -1$
$-2 \quad -2$

$\boxed{x \leq -3}$

number line: $-5 \; -4 \; -3$
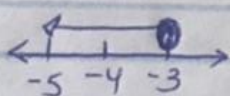
n) $5(2x-3) < 2(x+7) + 11$, $x \in R$
$10x - 15 < 2x + 14 + 11$
$10x - 15 < 2x + 25$
$-2x \qquad -2x$

$8x - 15 < 25$
$+15 \quad +15$

$\dfrac{8x}{8} < \dfrac{40}{8}$

$\boxed{x < 5}$

number line: $3 \; 4 \; 5$
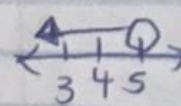
o) $\dfrac{n}{5} - 4 > -8$, $n \in R$
$\dfrac{5n}{5} - 20 > -40$
$n - 20 > -40$
$+20 \quad +20$

$\boxed{n > -20}$

number line: $-20 \; -19 \; -18$

p) $\dfrac{c}{2} \leq \dfrac{c}{3} - 1$, $c \in R$
$\dfrac{6c}{2} \leq \dfrac{6c}{3} - 6$
$3c \leq 2c - 1$
$-2c \quad -2c$

$\boxed{c \leq -1}$

number line: $-3 \; -2 \; -1$