2.2
Solving Inequalities by Adding and Subtracting

Your Name

Mrs. T

/ /

Notes

Objective: To be able to solve inequalities using addition or subtraction of constants. To be able to graph inequality solutions found. To understand what the solutions are.

Virtue/Skill: When we graph inequalities we might need to solve for a variable in order to graph it. With two variables on a coordinate plane, we need to be able to check our solutions to understand how to shade. Graphing on a number line is similar to graphing on a coordinate plane.

Remember:

<   ○
          open circle on the number line

>

≤

          ●
          closed circle on the number line

≥

Solving Addition/ Subtraction Inequalities

To solve:

1. pretend like it is an = sign and do what you have always done

2. graph your solution set on the number line

Remember: closed (filled in) circle if =
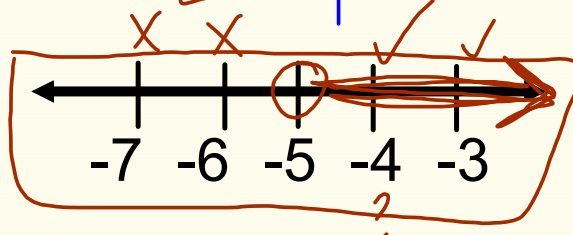
open (not fill in) circle if not ≠

ex 1. $k + 3 > -2$

$-3 \quad -3$

$K > -5$

$-7 \quad -6 \quad -5 \quad -4 \quad -3$

Check:

$(-6) + 3 > -2$

$-3 > -2$

No so

Solve and graph

eats
bigger
things

$u - 5 \leq 3$

$+5 \quad +5$

$u \leq 8$

6 7 8 9
✓ ✓ ✓

Check

$(8) - 5 \leq 3$

$3 \leq 3$
True

$r - 9 \geq 12$

$+9 \quad +9$

$r \geq 21$
greater than
or equal to

18   21   24
✓
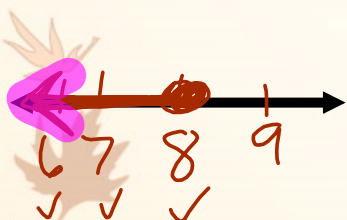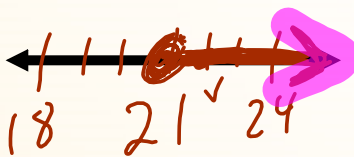
check!

$(21) - 9 \geq 12$

$12 \geq 12$

Check 2.2

$(22) - 9 \geq 12$

$13 \geq 12$
yes

$c + 6 < 2$

$-6 \quad -6$

$C < -4$
not
equal to
open
circle

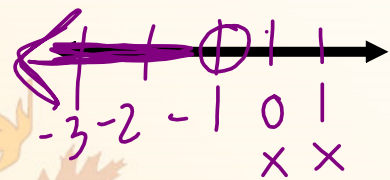-5 -4 -3
X

Watch out!

Check -3

$(-3) + 6 < 2$

$3 < 2$
False

When the variable is on the right side

*** Inequality sign will NOT match the arrow

Solve and graph and rewrite so the variable is on the left

$-6 > n - 5$

$+5 \qquad +5$

$-1 > n$

n was on pointy less than side

rewrite! strictly greater not equal to -1

$n < -1$

$-3 -2 -1 \; 0 \; 1$

$\times \; \times$

$\frac{1}{2} < 2 + a$

$-2 \qquad -2$

$-1.5 < a$

a was on open bigger side

rewrite

$a > -1.5$

$-3 -2 -1.5 -1 \; 0$
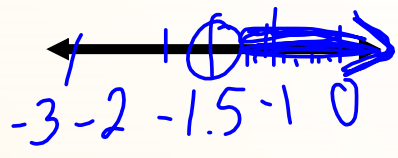
Check:

$-1 > 1 \qquad -1 > (0)$

False $\qquad -1 > 0$ False

Decimal Inequalities

$$x - 2.7 \geq -5.2$$

$+2.7 \quad +2.7$

$$x \geq -2.5$$

x is equal to -2.5

$\begin{array}{c} 4 \quad 12 \\ 5.8 \\ -2.7 \\ \hline 2.5 \end{array}$

-3   -2.5   -2   -1.5   -1

$$w - (-.32) \leq -50$$

Take a
Step to simplify
rewrite or
before solving!

$$W + 0.32 \leq -50$$
$$\underline{-0.32 \quad -0.32}$$
$$W \leq -50.32$$

$$\begin{array}{r} 50.00 \\ + 00.32 \\ \hline 50.32 \end{array}$$

-52 -51 -50.32 -50 -49
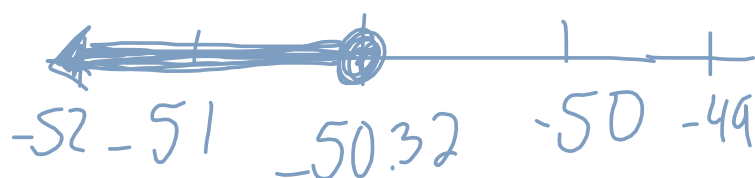
Answer Key:
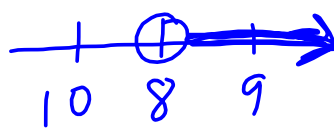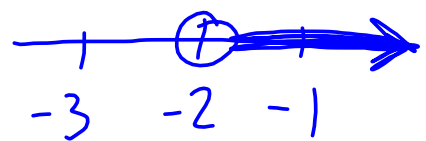
Pg. 65　#7,10,13,15,27,28

Challenge:　pg. 65　#14,20,25

7.　$x < -1$
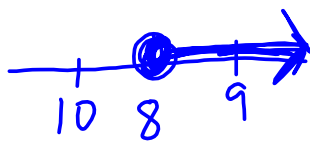

10.　$c > 8$

13.　$w > -2$

15.　$h \geq 8$

27.　Graph going in wrong direction
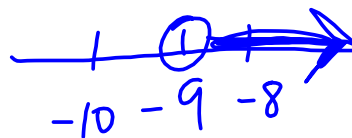

28.　10 needed to be added to <u>both</u> sides, not just one

$$-10 + x \geq -9$$
$$+10 \qquad +10$$
$$\overline{\qquad x \geq 1 \qquad}$$
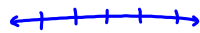

14.　$q \leq 12$

20.　$z > -9$

25.　a.) $38 + w \leq 50$

$$w \leq 12$$

b) no, adding 14 lbs total does not work in the inequality, 14 is not a possible solution, it is not ≤ 12.

Solve and graph the solutions

1. $w + 7 \leq 12$

2. $x - 9 > 14$

3. $-8 + y < 20$

4. $11 + a \geq 1$

Notice: the variable is not on the left

5. $7 < x - 12$

6. $15 \geq x + 35$

7. $21 \leq x - (-5)$

Notice: Numbers here are decimals.
Write out the work but use
a calculator to help you
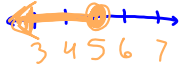add and subtract the amounts.

8. $2.50 + x \geq 17.99$
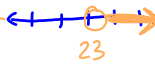
Solve and graph the solutions

1. $w + 7 \leq 12$
$-7 \quad -7$
$w \leq 5$
less than
or equal to
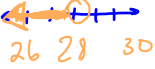
2. $x - 9 > 14$
$+9 \quad +9$
$x > 23$
greater
than only
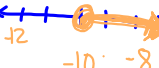
3. $-8 + y < 20$
$+8 \quad +8$
$y < 28$
less than
only

4. $11 + a \geq 1$
$-11 \qquad -11$
$a \geq -10$
greater than
or equal to

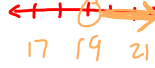**Notice: the variable is not on the left**

5. $7 < x - 12$
$+12 \quad +12$
$19 < x$
rewrite
$x > 19$
x is greater
than 19

6. $15 \geq x + 35$
$-35 \qquad -35$
$-20 \geq x$
-120 is greater than x
or equal to
rewrite
$x \leq -20$
x is less than
or equal to -20

7. $21 \leq x - (-5)$
rewrite
$21 \leq x + 5$
$-5 \qquad -5$
$16 \leq x$
rewrite
$x \geq 16$

Notice: Numbers here are decimals. Write out the work but use a calculator to help you add and subtract the amounts.

8. $2.50 + x \geq 17.99$
$-2.50 \qquad -2.50$
$x \geq 15.49$