

# Day 7/8 Guided Notes

Name: key

Date: \_\_\_\_\_

OBJECTIVE: SWBAT add, subtract, multiply, and divide numbers

and fractions in linear equations.

## NEGATIVE NUMBERS

### Addition and Subtraction

When adding and subtracting negative numbers, it may help to have a number line.



### ADDING Negative Numbers

- Negative + Negative = negative

EX:  $(-5) + (-3) = \underline{-8}$

- When adding two negatives, the value becomes more negative

EX:  $(-5) + (-3) = \underline{-8}$



- Positive + negative OR Negative + positive

- When performing addition in this case, we need to subtract the smaller number from the larger number and then we use the sign of the larger for our solution.

EX 1:  $7 + (-3) = \underline{4}$

EX 2:  $(-5) + (4) = \underline{-1}$

## SUBTRACTING negative numbers

When we have a **positive** and **negative** sign next to each other, the negative sign takes over:

$$\text{Ex: } (-3) + (-1) = \underline{-3-1} = \underline{-4}$$

- Negative — Positive = negative

$$\text{EX: } (-5) - (3) = \underline{-5-3} = \underline{-8}$$



When we have two **negative** signs next to each other, then the two negative signs will change to a positive sign:

Examples:

- Positive — Negative = positive

$$\text{EX: } 5 - (-3) = \underline{5+3} = \underline{8}$$



- Negative — Negative = negative + positive

$$\text{EX: } (-5) - (-3) = \underline{-5+3} = \underline{-2}$$

## MULTIPLYING and DIVIDING Negative Numbers

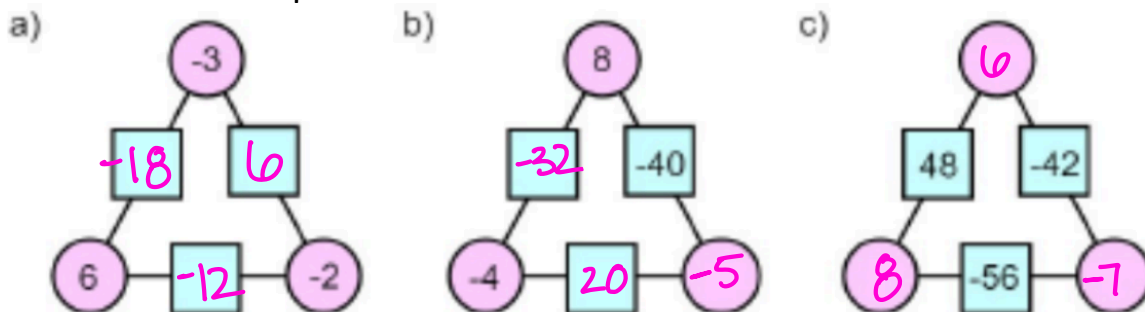
- When you multiply or divide two numbers with the same sign (both positive or both negative), the result is positive.
  - If both signs are same, answer is positive
    - $-5 \times (-6) = \underline{30}$
    - $-42 \div (-7) = \underline{6}$
  - If there is one positive and one negative, then the answer is negative.
    - $7 \times (-2) = \underline{-14}$
    - $-35 \div (5) = \underline{-7}$

## PRACTICE PROBLEMS:

- Complete the table.

+	-2	-1	2	5	10
-6	$-6 + (-2) = -8$	$-6 + (-1) = -7$	$-6 + 2 = -4$	$-6 + 5 = -1$	$-6 + 10 = 4$
-10	$-10 + (-2) = -12$	$-10 - 1 = -11$	$-10 + 2 = -8$	$-10 + 5 = -5$	$-10 + 10 = 0$
2	$2 + (-2) = 0$	$2 - 1 = 1$	$2 + 2 = 4$	$2 + 5 = 7$	$2 + 10 = 12$
3	$3 + (-2) = 1$	$3 - 1 = 2$	$3 + 2 = 5$	$3 + 5 = 8$	$3 + 10 = 13$
-4	$-4 + (-2) = -6$	$-4 - 1 = -5$	$-4 + 2 = -2$	$-4 + 5 = 1$	$-4 + 10 = 6$

- Multiplication Arithmagons 1: The numbers in the circles multiply to make the numbers in the squares between them



3. . Show your work for the following exercises below

a.  $6x = -54$   
 $\div 6 \quad \div 6$

$$x = -9$$

b.  $8k - 7 = -71$

$$8k = -64$$

$$k = -8$$

c.  $6p = -30$

$$p = -5$$

d.  $-4z = -20 + 4$

$$-4z = -16$$

$$z = 4$$

e.  $-2x + 5x = 20 - 4$

$$3x = 16$$

$$x = \frac{16}{3}$$

f.  $-5 - (3)4 = -2m$

$$-5 - 12 = -2m$$

$$-17 = -2m$$

$$m = -\frac{17}{-2} = \frac{17}{2}$$

g.  $8b(2b - 3) = 30$

$$16b^2 - 24b = 30$$

h.  $2x + 3(-9) = -5$

$$2x - 27 = -5$$

$$2x = 22$$

$$x = 11$$

i.  $3h + (-3(2h + 5)) = 3$

$$3h + (-6h - 15) = 3$$

$$-3h - 15 = 3$$

$$-3h = 18$$

$$h = -6$$

# DAY 8: FRACTIONS

## ADDING AND SUBTRACTING

Before beginning to perform addition or subtraction with fractions, we need to make sure that each fraction has a common denominator (bottom number in fraction) → "Like Denominator"

- Addition/Subtraction with Common Denominator: Add or subtract the numerator and keep the denominator the same

Ex 1:  $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

Ex 1:

$$\frac{5}{6} - \frac{3}{6} = \frac{2}{6}$$

- Addition/Subtraction with Uncommon Denominator:

- Find the least common denominator.
- Rewrite each fraction with the same common denominator by multiplying each fraction's numerator and denominator by the other fraction's denominator

Ex 1:

$$\frac{2}{3} + \frac{2}{5} = \frac{2 \times 5}{3 \times 5} + \frac{2 \times 3}{5 \times 3} = \frac{10}{15} + \frac{6}{15} = \frac{16}{15}$$

Ex 2:

$$\frac{5}{8} - \frac{1}{4} = \frac{5}{8} - \frac{2}{8} = \frac{3}{8}$$

## MULTIPLYING AND DIVIDING

- Multiplying fractions:

- Multiply the numerator (top numbers) of each fraction
- Multiply the denominator (bottom numbers) of each fraction
- Simplify the fraction to the fraction terms by finding the greatest common denominator (GCD) and dividing both the numerator and denominator by it.

Ex:

$$\frac{2}{5} \times \frac{6}{7} = \frac{12}{35}$$

- Dividing fractions:

- Find the reciprocal of the divisor by flipping the fraction's numerator and denominator.
- Multiply by the reciprocal.
- Simplify your solution.

EX:  $\overset{K}{\frac{2}{5}} \div \overset{F}{\frac{2}{3}} = \frac{2}{5} \times \frac{3}{2} = \frac{6}{10} = \boxed{\frac{3}{5}}$

Emiliano/Zak Method

K: keep  
C: change  
F: Flip

FRACTIONS TIP: If you encounter a mixed number (ie  $1\frac{1}{2}$ ,  $3\frac{2}{5}$ , etc)

- Multiply the whole number by the denominator
- Add the numerator to the product.
- Write the sum on top of the original numerator which becomes the new numerator

EX:  $2\overset{+}{\frac{3}{4}} = \frac{11}{4}$

**PRACTICE PROBLEMS:**

a.  $\frac{7}{8} + \frac{3 \times 2}{4 \times 2}$

$= \frac{7}{8} + \frac{6}{8} = \boxed{\frac{13}{8}}$

b.  $\frac{10}{11} \times 1\frac{7}{15}$

$\frac{10}{11} \cdot \frac{22}{15}$   
 $= \boxed{\frac{4}{3}}$

c.  $\frac{5}{6} \div \frac{1}{2}$

$\frac{5}{6} \times \frac{2}{1} = \frac{10}{6}$   
 $= \boxed{\frac{5}{3}}$

d.  $\frac{7}{8} - \frac{3}{4}$

$\frac{7}{8} - \frac{6}{8} = \boxed{\frac{1}{8}}$

e.  $4\frac{1}{2} \times \frac{2}{3}$

$= 3$

f.  $3\frac{1}{7} \div 2\frac{5}{14}$

$= \frac{4}{3} = 1\frac{1}{3}$

g.  $1\frac{1}{4} + \frac{3}{8}$

$= \boxed{1\frac{5}{8}}$

h.  $2\frac{1}{6} \times 1\frac{1}{2}$

$= \frac{13}{6} \cdot \frac{3}{2}$   
 $= \boxed{\frac{13}{4}}$

i.  $6 \times 1\frac{1}{9}$

$= 6 \cdot \frac{10}{9}$   
 $= \frac{60}{9} = \boxed{\frac{20}{3}}$

j.  $\frac{3}{4} \div \frac{3}{7}$

$\frac{3}{4} \times \frac{7}{3}$   
 $= \frac{21}{12} = \boxed{\frac{7}{4}}$

k.  $\frac{29}{8} + \frac{9}{7}$

$= \boxed{\frac{275}{56}}$

l.  $\frac{1}{2} \div 6$

$\frac{1}{2} \cdot \frac{1}{6}$   
 $= \boxed{\frac{1}{12}}$

m.  $\frac{16}{27} - \frac{5}{24}$

$= \boxed{\frac{83}{216}}$

n.  $3 \div 1\frac{2}{5}$

$= \boxed{\frac{15}{7}}$

o.  $3\frac{3}{8} \times 2\frac{2}{9}$

$= \boxed{\frac{15}{2}}$   
 $= 7\frac{1}{2}$

p.  $\frac{2}{3} + \frac{1}{21} - \frac{2}{7}$

$= \boxed{\frac{3}{7}}$