Name: Key Class Period: ____ Janik208 N

Unit 1 - The Real Number System
Chapter 1 - The Real Number System (Non-Calculator)
Notes Packet

- **Review of Mental Math Skills**

Add the following:

352 + 939

939 + 352 = 1291 → **1291**

209 + 1938

1938 + 209 = 2147 → **2147**

1002 + 193

1002 + 193 = 1195 → **1195**

Subtract the following:

183 - 22

183 − 22 = 161 → **161**

1998 - 289

1998 − 289 = 1709 → **1709**

3002 - 1192

3002 − 1192 = 1810 → **1810**

Multiply the following:

84 x 27

84 × 27: 588 + 1680 = 2268 → **2268**

91 x 501

501 × 91: 501 + 45090 = 45591 → **45591**

329 x 170

329 × 170: 000 + 23030 + 32900 = 55930 → **55930**

Divide the following:

3664 / 8

$8\overline{)3664} = 458$; -32, 46, -40, 64, -64, 0

458

180 / 15

$15\overline{)180} = 12$; -15, 30, -30, 0

12

688 / 16

$16\overline{)688} = 43$; -64, 48, -48, 0

43

16 (1), +16 = 32 (2), +16 = 48 (3), +16 = 64 (4)

Mixed Practice:

1033 - 232

1033 − 232 = 801

801

2983 + 2948

2983 + 2948 = 5931

5931

1092 / 7

$7\overline{)1092} = 156$; -7, 39, -35, 42, -42, 0

156

773 x 72

773 × 72: 1546 + 54110 = 55656

55656

→ HW part 1

Mindy was filling vans with students from a group of 469 students. She filled each van with 7 students until she did not have enough to fill a van. (How many students were left in the group?)

$7\overline{)469} = 67$; -42, 49, -49, 0

There were 0 kids left in the group.

The distance from Village A to Village B is 79,068 meters. This is 1,451 more meters than the distance from Village A to Village C. What is the distance (in meters) from Village A to Village C?

A − B = 79068

A − C = 79068 − 1451

79068 − 1451 = 77617

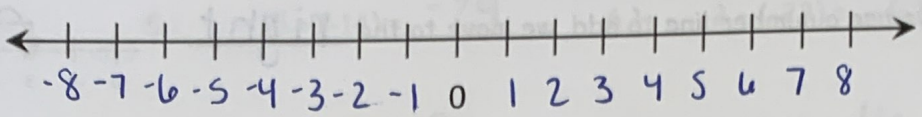
77617 meters

→ HW part 2

Integers

What are integers? Whole numbers (0, 1, 2, 3...) and their opposites

The Number Line:



Write an integer for each situation:

1.) a 3-yard gain 3

2.) 8 degrees below normal -8

3.) a $75 deposit 75

4.) a 21-pound loss -21

5.) 5 miles above sea level 5

6.) a $40 deduction -40

7.) 2 strokes under par -2

8.) a $15 surcharge 15

Comparing and Ordering Integers: Place a < or > on the line to complete each statement.

9.) -12 < 5

10.) -7 > -23

11.) 1 > -6

12.) -18 < -15

13.) 20 > -25

14.) -13 < 0

15.) -36 > -40

16.) -29 < -28

Put the following set of integers in order from least to greatest:

17.) {~~4~~, ~~0~~, ~~-9~~, ~~2~~, ~~-5~~, ~~-1~~, ~~13~~}

-9, -5, -1, 0, 2, 4, 13

18.) {~~-27~~, ~~21~~, ~~-24~~, ~~16~~, ~~-11~~, ~~-8~~}

-27, -24, -11, -8, 16, 21

Absolute Value:

Evaluate each expression:

19.) |7| 7

20.) |-20| 20

21.) |-4| 4

22.) |35| 35

23.) |-11| 11

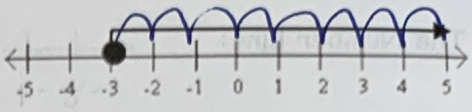
→ HW part 3

- **Operations with Integers**

Adding Integers:

-3 + 8 = 5

✓ If we use a number line to add, we move to the right.



✓ If we can't use a number line (maybe the numbers are too big or we are unable to draw a line), we can add the numbers using the signs.

Same Signs:	Add the numbers as usual and use the sign that's given.

Different Signs:	Use the sign of the "larger" number and then find the "difference" between the two numbers.

1.) 1 + 8 = 9

2.) -11 + 9 = -2

3.) -2 + -6 = -8

4.) -7 + 7 = 0

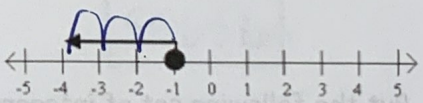
5.) -21 + 3 = -18

6.) -9 + 13 = 4

Subtracting Integers:

-1 - 3 = -4

✓ If we use a number line to subtract, we move to the left.



✓ If we don't use a number line, we can turn the subtraction into addition in order to make the problem easier.

When subtracting two numbers, use **KEEP, CHANGE, FLIP.**
Then, the problem changes from subtraction to addition.
Then, you can use the "addition" rules we learned above!

1.) -9 - 4 = -13
-9 + -4

2.) 2 - 5 = -3
2 + -5

3.) -9 - (-4) = -5
-9 + 4

4.) -3 - 3 = -6
-3 + -3

5.) - 28 - 8 = -36
-28 + -8

6.) 5 - (-11) = 16
5 + 11

ed Examples:

1.) $2 + (-6) =$ -4

2.) $9 - (-2) =$ 11

3.) $-20 + (-5) =$ -25

4.) $0 - (-10) =$ 10

5.) $-15 + (-14) =$ -29

6.) $-2 - (-23) =$ 21

7.) $-7 + (-1) =$ -8

8.) $-12 - (-3) =$ -9

9.) $18 + (-2) =$ 16

10.) $-6 - (-19) =$ 13

11.) $1 + (-7) =$ -6

12.) $21 - (-7) =$ 28

You try!

13.) $-9 + 6 =$ -3

14.) $-5 + (-9) =$ -14

15.) $-9 - 9 =$ -18

16.) $12 - 7 =$ 5

17.) $3 - (-7) =$ 10

18.) $-11 - 5 =$ -16

→ HW part 4 and worksheet

Absolute Value Examples:

1.) $|-13| + |15| =$ 28
13 + 15

2.) $|23 + 15| =$ 38
|38|

3.) $|21 - 8| =$ 13
|13|

4.) $|24| - |-17| =$ 7
24 - 17

5.) $|-3| + |-5| =$ 8
3 + 5

6.) $|-11| - |-6| =$ 5
11 - 6

7.) $|-7 - 16| =$ 23
|-23|

8.) $|4| - |-4| =$ 0
4 - 4

9.) $|14 - (-11)| =$ 25
|14 + 11|
|25|

→ HW part 5

Word Problems:

When Melanie subtracted -20 - (-20), she got a difference of -40. (Is her answer correct?) If not, (what mistake did she make?) State the correct answer in your explanation.

She did not use keep, change, flip properly. It would be -20 + 20 and then would get 0.

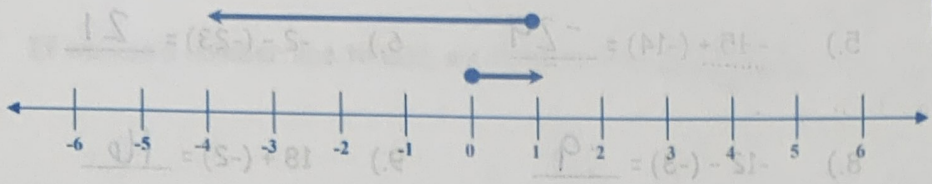
19 The temperature on Saturday was -5 degrees Celsius. By Sunday, the temperature rose to -1 degree. (Find the CHANGE in temperature.)

-5 → -1 The temperature changed by 4 degrees.

Adding and Subtracting Integers on a Number Line:

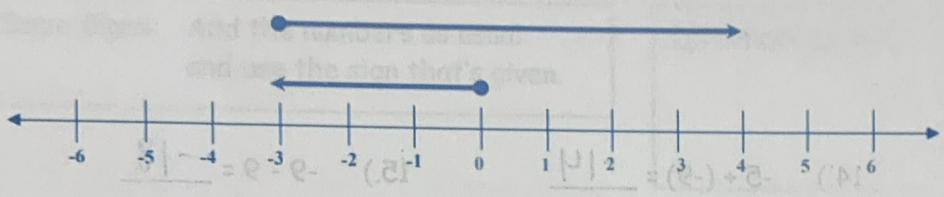
Write the expression the number line represents. Then, find the difference.

1.)



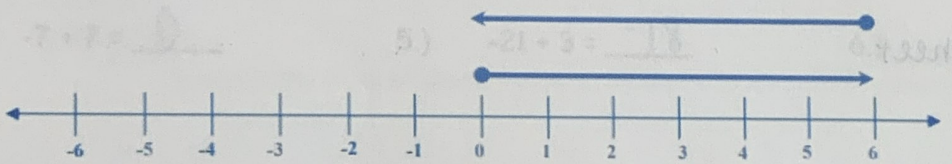
1 - 5 = -4

2.)



-3 + 7 = 4

3.)

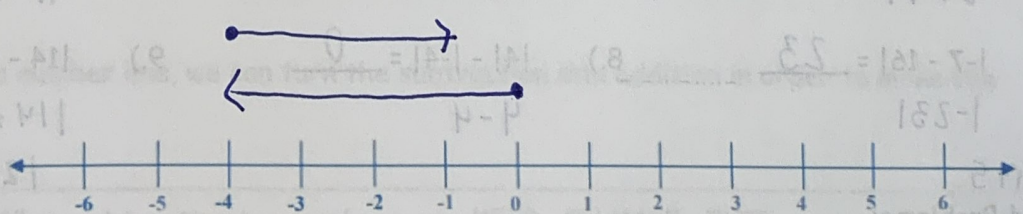


6 - 6 = 0

Now, try drawing them! Then, find the difference.

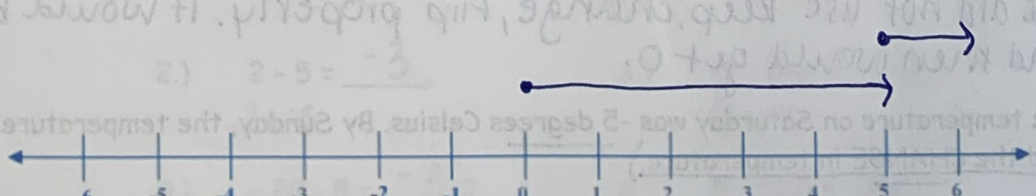
4.) $(-4) - (-3) =$

-4 + 3 = -1



5.) $5 - (-1) =$

5 + 1 = 6



→HW part b

...riplying and Dividing Integers:

Rules for BOTH Multiplying and Dividing Integers:

(+) × (+) = +

(−) × (−) = +

(+) × (−) = −

(−) × (+) = −

★ Notice that these are different than add/sub rules!

Simplify the following expressions by multiplying or dividing.

1.) $-9 \times -3 =$ 27

2.) $63 \div 7 =$ 9

3.) $8(-9) =$ -72

4.) $18 \div -9 =$ -2

5.) $-6(10) =$ -60

6.) $90/10 =$ 9

7.) $-8 * -3 =$ 24

8.) $-21/-3 =$ 7

9.) $16 \times -2 =$ -32

10.) $56/-8 =$ -7

11.) $-4(-7) =$ 28

12.) $\frac{16}{-4} =$ -4

Summary: Multiplying/dividing two of the same sign: positive

Multiplying/dividing two different signs: negative

Multiplying Multiple Integers:

Examples: $(2)(-3)(5)$

$(-6)(5) =$ **-30**

$(-7)(-2)(3)$

$(14)(3) =$ **42**

$(10)(20)(2)$

$(200)(2) =$ **400**

$(-4)(-9)(4)$

$(36)(4) =$ **144**

$(-19)(0)(5)$

$(0)(5) =$ **0**

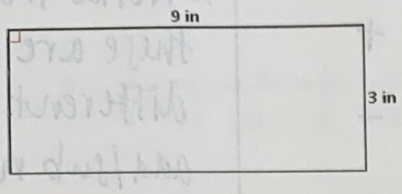
$(12)(-1)(-4)$

$(-12)(-4) =$ **48**

→HW part 7

Word Problems:

1.) Mr. Rodkey is making his famous peanut butter brownies for a baking contest. Each pan must be covered in icing. A picture of the pan of brownies is shown.



↗ no equals sign!

1.) Write an expression to determine how much area is covered with icing.

9×3

2.) What is the total area of the pan of brownies that is covered with icing?

27 in^2

2.) Nellie is a florist at a local flower shop. She is making grand bouquets that include 7 dozen lilies each. If Nellie made 19 grand bouquets last week, how many lilies did she use?

$$\begin{array}{r} {}^{1}12 \\ \times\ 7 \\ \hline 84 \end{array}$$

$$\begin{array}{r} {}^{3}84 \\ \times\ 19 \\ \hline 756 \\ +\ 840 \\ \hline 1596 \end{array}$$

1596 lilies

3.) Sally withdrew $23 at a time from her bank account and withdrew a total of $782. How many times did she withdraw money?

$$\begin{array}{r} 23 \\ +23 \\ \hline 46 \\ +23 \\ \hline 69 \\ +23 \\ \hline 92 \end{array}$$
(1, 2, 3, 4)

$$\begin{array}{r} 34 \\ 23\overline{)782} \\ -69\downarrow \\ \hline 92 \\ -92 \\ \hline 0 \end{array}$$

34 times

4.) Mrs. Adams has 4 Dalmatians that each had 5 puppies. Each puppy has 42 spots. How many spots do all of the dogs have?

* assume each Dalmatian has 42 spots

$$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \text{ dogs} \end{array}$$

$$\begin{array}{r} 42 \\ \times 20 \\ \hline 00 \\ +840 \\ \hline 840 \end{array}$$

840 spots

5.) A scuba diver can dive at a rate of -10 feet per minute. How long will it take him to reach a depth of -230 feet?

$$\begin{array}{r} 23 \\ 10\overline{)230} \\ -20\downarrow \\ \hline 30 \\ -30 \\ \hline 0 \end{array}$$

23 minutes

→ HW part 8