

Foundations of Algebra
 Day 1 - Adding Integers
 Practice Assignment

Unit 1 Number Sense & Quantity

Name: Key Practice
 0 25 50 75 100

1	2	3	4	5
$4 + 6 = 10$	$3 + 9 = 12$	$2 + 7 = 9$	$1 + 4 = 5$	$7 + 10 = 17$
$5 + -2 = 3$	$6 + -5 = 1$	$8 + -4 = 4$	$9 + -3 = 6$	$7 + -3 = 4$
$2 + -7 = -5$	$2 + -3 = -1$	$4 + -7 = -3$	$2 + -7 = -5$	$5 + -9 = -4$
$8 + -3 = 5$	$10 + -5 = 5$	$5 + -6 = -1$	$2 + -3 = -1$	$4 + -5 = -1$
$9 + -6 = 3$	$7 + -2 = 5$	$8 + -3 = 5$	$7 + -3 = 4$	$10 + -7 = 3$
$-3 + 4 = 1$	$-1 + 7 = 6$	$-3 + 7 = 4$	$-2 + 4 = 2$	$-7 + 5 = -2$
$5 + 1 = 6$	$-4 + 2 = 6$	$7 + 4 = 11$	$5 + 3 = 8$	$6 + 3 = 9$
$-6 + 7 = 1$	$-5 + 9 = 4$	$-6 + 9 = 3$	$-4 + 7 = 3$	$-2 + 6 = 4$
$-5 + 3 = -2$	$-6 + 2 = -4$	$-3 + 6 = 3$	$-7 + 5 = -2$	$-8 + 5 = -3$
$-2 + -6 = -8$	$-3 + 3 = 0$	$-4 + -5 = -9$	$-7 + -5 = -12$	$-5 + -7 = -12$

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2. Explain (in complete sentences) what absolute value means.

Absolute value is the distance a number is from zero.

3. Find the absolute value of the following: a. $|5| = 5$ b. $|-87| = 87$ c. $|-23| = 23$ d. $|0| = 0$

4. Check all the columns that apply to the numbers below. Then circle the check that most specifically describes that number.

Number	Real	Irrational	Rational	Integer	Whole	Natural
-7	✓		✓	✓		
0	✓		✓	✓	✓	
$\frac{2}{5}$	✓		✓			
0.34	✓		✓			
$\sqrt{12}$	✓	✓				
2.578...	✓	✓				
6.42	✓		✓			
$\frac{12}{4} = 3$	✓		✓	✓	✓	✓
9	✓		✓	✓	✓	✓
$\frac{1}{2}\pi$	✓	✓				

5. Explain (in a complete sentence) what makes the natural numbers and whole numbers different.

Whole numbers contain the number 0 and natural numbers do not.

6. Explain (in a complete sentence) what makes the rational and irrational number numbers different.

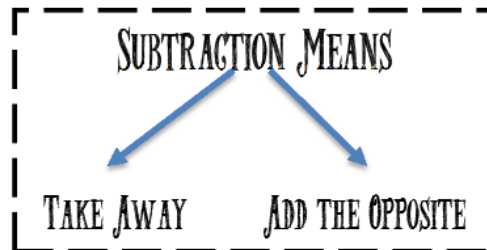
Rational numbers can always be written as a fraction. Irrational numbers are numbers that go on forever without repeating.



Today's Notes

Day 2: Subtracting, Multiplying, and Dividing Integers

When subtracting integers, you need to understand the meaning of subtracting integers:



Real World Connection:

a. You are attending a "positive" party. It is filled with positive people. What could you do to make this party less positive?

- add in some negative people
- remove some of the positive people

Therefore.... Subtracting = add a negative

b. You are attending a "negative" party. It is filled with negative people. What could you do to make this party less negative?

- add some positive people
- take away some negative people

Therefore.... Subtracting = adding a negative

Practice: Take the following subtraction problems and rewrite them using the party examples from above.

a. $6 - 4 \rightarrow$

You have 6 positive people
take away 4 positive people
= 2 positive people

b. $-6 - (-4) \rightarrow$

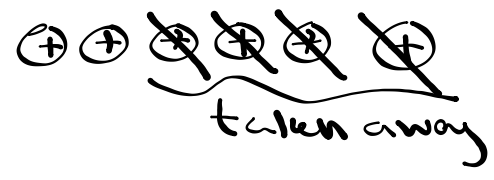
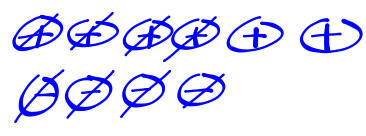
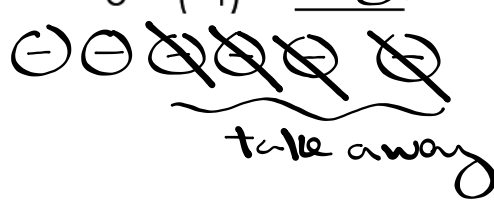
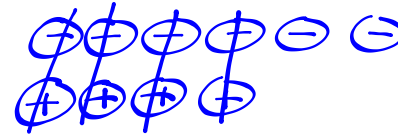
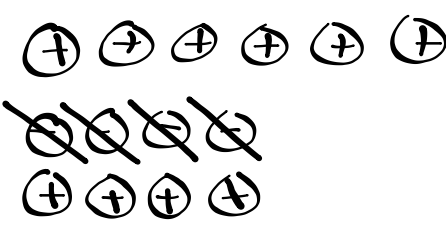
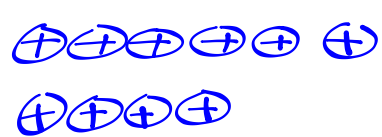
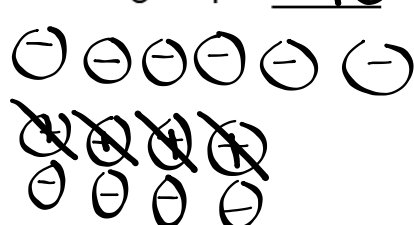
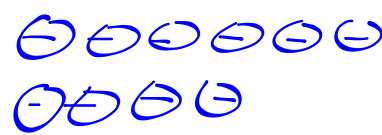
You have 6 negative people and you take away 4 negative people
= 2 negative people

c. $6 - (-4) \rightarrow$

You have 6 positive people take away 4 negative people
= 10 positive people

d. $-6 - 4 \rightarrow$

Integer Subtraction with Counters

Take Away	Add the Opposite
$6 - 4 = \underline{2}$ 	$6 - 4 = \underline{2}$ $6 + (-4)$ 
$-6 - (-4) = \underline{-2}$ 	$-6 - (-4) = \underline{-2}$ $-6 + (+4)$ 
$6 - (-4) = \underline{10}$ 	$6 - (-4) = \underline{10}$ $6 + (+4)$ 
$-6 - 4 = \underline{-10}$ 	$-6 - 4 = \underline{-10}$ $-6 + (-4)$ 

Rules for Adding & Subtracting Integers Mentally

Type of Addition	Rule
Adding Two Positive Numbers	always positive
Adding Two Negative Numbers	add the $ AV $ of the #'s always negative
Adding a Positive & Negative Number	the bigger # gets the sign

Type of Subtraction	Rule
Subtracting Any Two Numbers	$\overset{\text{big \#}}{\text{neg}} - \overset{\text{small \#}}{\text{pos}} = \text{neg}$ $\text{pos} - \text{neg} = \text{pos}$ $\text{neg} - \text{neg} = \text{neg}$

Practice



Directions: Add or subtract the following problems without the line or counters to assist you if necessary.

a. $3 + -8 = \underline{-5}$

b. $5 - 3 = \underline{2}$

c. $2 - 9 = \underline{-7}$

d. $8 + -2 = \underline{6}$

e. $10 + -5 = \underline{5}$

f. $-8 + 8 = \underline{0}$

g. $6 - (-2) = \underline{8}$

h. $-4 - 7 = \underline{-11}$

i. $3 + -7 = \underline{-4}$

j. $13 + -5 = \underline{8}$

k. $1 - (-3) = \underline{4}$ ~~14~~

l. $-12 + 7 = \underline{-5}$

m. $6 - (-7) = \underline{13}$

n. $-4 + 9 = \underline{5}$

o. $2 + -6 = \underline{-4}$

Foundations of Algebra

Unit 1: Number Sense & Quantity

Notes

Directions: Determine the missing number to complete each addition or subtraction problem. Use a number line or counters if necessary.

p. $8 + \underline{-2} = 6$



q. $-4 + \underline{7} = 3$



r. $-10 + \underline{8} = -2$

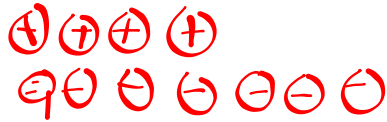
s. $-5 - \underline{(-7)} = 2$



t. $3 - \underline{11} = -8$

u. $-5 - \underline{7} = -12$

v. $4 - \underline{7} = -3$



w. $-7 - \underline{2} = -9$

x. $2 + \underline{-5} = -3$

Quick

Multiplying & Dividing Integers

Have you ever wondered where the rules for multiplying integers come from? You probably remember your teacher telling you the following rules when it comes to multiplying:

Rules for Multiplying Integers

POSITIVE X POSITIVE = POSITIVE
 NEGATIVE X POSITIVE = NEGATIVE
 POSITIVE X NEGATIVE = NEGATIVE
 NEGATIVE X NEGATIVE = POSITIVE

Where did these rules come from???

Rules for Dividing Integers

POSITIVE ÷ POSITIVE = POSITIVE
 NEGATIVE ÷ POSITIVE = NEGATIVE
 POSITIVE ÷ NEGATIVE = NEGATIVE
 NEGATIVE ÷ NEGATIVE = POSITIVE

Where did these rules come from???

Remember, multiplication is repeated addition

Expression	Description	Addition Sentence	Product
3×4	3 groups of 4	$4 + 4 + 4$	12
3×-4	3 groups of -4	$-4 + -4 + -4$	-12
-3×4	opp of 3 groups of 4	$-(4 + 4 + 4)$	-12
-3×-4	opp of 3 groups of -4	$-(-4 + -4 + -4)$	12

Practice: Answer the following questions regarding multiplication.

1. Determine the single digit integers that make each number sentence true:

a. $\underline{\quad} \times \underline{\quad} = -25$

b. $\underline{\quad} \times \underline{\quad} = 18$

c. $\underline{\quad} \times 4 = 16$

2. Determine the product of the following expressions:

a. $3 \times 2 \times -4 = \underline{24}$

b. $-3 \times -2 \times -4 = \underline{-24}$

c. $3 \times -2 \times 4 = \underline{-24}$

d. $-3 \times -2 \times 4 = \underline{24}$

e. $3 \times 2 \times -4 = \underline{-24}$

f. $-3 \times 2 \times 4 = \underline{-24}$

g. If the number of integers that are negative is an odd number, the sign of the product will be negative

h. If the number of integers that are negative is an even number, the sign of the product will be positive

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3. Determine the sign of each product and how you know:
- the product of four negative integers:
 - the product of seven negative integers:
 - the product of three positive numbers and nine negative numbers:

Critical Thinking: Complete the table by writing the sign (+, -, or +/-) to describe the sum, difference, product, or quotient. Then give an example in each box.

Description of Integers	Addition (Sum)	Subtraction (Difference)	Multiplication (Product)	Division (Quotient)
Two positive integers				
Two negative integers				
One positive & one negative integer				

Additional Practice and Review Packet

Foundations of Algebra

Unit 1: Number Sense & Quantity

Practice

Day 2 – Subtracting, Multiplying, & Dividing Integers

Name: _____

Practice Assignment

0 25 50 75 100

1	2	3	4	5
$4 - 6 =$	$3 - 9 =$	$2 - 7 =$	$1 - 4 =$	$7 - 10 =$
$5 - -2 =$	$6 - -5 =$	$8 - -4 =$	$9 - -3 =$	$7 - -3 =$
$2 - -7 =$	$2 - -3 =$	$4 - -7 =$	$2 - -7 =$	$5 - -9 =$
$8 - -3 =$	$10 - -5 =$	$5 - -6 =$	$2 - -3 =$	$4 - -5 =$
$9 - -6 =$	$7 - -2 =$	$8 - -3 =$	$7 - -3 =$	$10 - -7 =$
$-3 - 4 =$	$-1 - 7 =$	$-3 - 7 =$	$-2 - 4 =$	$-7 - 5 =$
$5 - 1 =$	$4 - 2 =$	$7 - 4 =$	$5 - 3 =$	$6 - 3 =$
$-6 - 7 =$	$-5 - 9 =$	$-6 - 9 =$	$-4 - 7 =$	$-2 - 6 =$
$-5 - 3 =$	$-6 - 2 =$	$-3 - 6 =$	$-7 - 5 =$	$-8 - 5 =$
$-2 - -6 =$	$-3 - 3 =$	$-4 - -5 =$	$-7 - -5 =$	$-5 - -7 =$

Score: ___/10

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2. Multiply or divide the following expressions:

a. -4×5

b. 3×3

c. -5×-2

d. 7×-3

e. -6×4

f. -7×-5

g. $\frac{-35}{5}$

h. $\frac{30}{5}$

i. $\frac{-24}{-3}$

j. $\frac{81}{-9}$

k. $\frac{27}{-9}$

l. $\frac{-20}{-10}$

Foundations of Algebra

Day 1 Integer Addition and Subtraction

Practice

1	2	3	4	5
$4 - 6 = -2$	$3 - 9 =$	$2 - 7 = -5$	$1 - 4 =$	$7 - 10 = -3$
$5 + 2 = 3$	$6 + 5 =$	$8 + 4 = 4$	$9 + 3 =$	$7 + 3 = 4$
$2 + -7 = -5$	$2 + -3 =$	$4 + -7 = -3$	$2 + -7 =$	$5 + -9 = -4$
$8 - (-3) = 11$	$10 - (-5) =$	$5 - (-6) = 11$	$2 - (-3) =$	$4 - (-5) = 9$
$9 + -6 = 3$	$7 + -2 =$	$8 + -3 = 5$	$7 + -3 =$	$10 + -7 = 3$
$-3 - 4 = -7$	$-1 - 7 =$	$-3 - 7 = -10$	$-2 - 4 =$	$-7 - 5 = -12$
$5 - 1 = 4$	$4 - 2 =$	$7 - 4 = 3$	$5 - 3 =$	$6 - 3 = 3$
$-6 + 7 = 1$	$-5 + 9 =$	$-6 + 9 = 3$	$-4 + 7 =$	$-2 + 6 = 4$
$-5 - 3 = -8$	$-6 - 2 =$	$-3 - 6 = -9$	$-7 - 5 =$	$-8 - 5 = -13$
$-2 - (-6) = 4$	$-3 - (-3) =$	$-4 - (-5) = 1$	$-7 - (-5) =$	$-5 - (-7) = 2$


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Score: ___/10

Score: ___/10

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