

WIN Week 5 – Operations with Integers

Students will add and subtract integers without calculators.

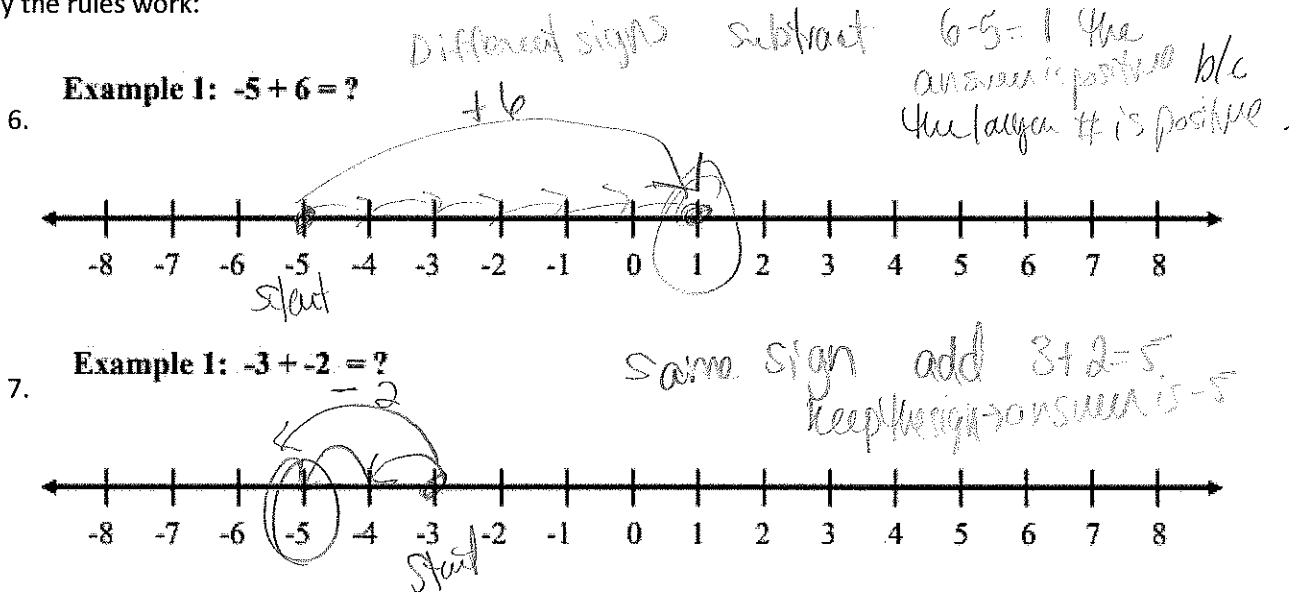
Warm up:

1. What is an integer? *A positive or negative whole number*
2. What does it mean to add? *increase*
3. What does it mean to subtract? *decrease*
4. What is a negative number? *a number less than a zero*
5. Give an example of a real situation that needs a negative number to make sense. *Below sea level is a negative number*

THE RULES

- A. Same sign means add the numbers and keep the sign.
- B. Different sign means subtract and keep the sign of the larger number.

Why the rules work:



Practice using the rules:

- |                   |                   |                     |
|-------------------|-------------------|---------------------|
| 1. $-7 + 6 = -1$  | 6. $-1 + -6 = -7$ | 1. $-5 + -9 = -14$  |
| 2. $5 + -8 = -3$  | 7. $-4 + 11 = 7$  | 2. $12 + -15 = -3$  |
| 3. $-4 + -4 = -8$ | 8. $8 + -10 = -2$ | 3. $-10 + -4 = -14$ |
| 4. $-2 + 9 = 7$   | 9. $7 + -4 = 3$   | 4. $6 + 9 = 15$     |
| 5. $1 + 5 = 6$    | 10. $-8 + 15 = 7$ | 5. $-14 + 20 = 6$   |

$$1. -3 + -5 + -2 = -10$$

$$6. -8 + -2 + 6 + 4 = 0$$

$$2. 4 + -8 + -3 = -7$$

$$7. 5 + -7 + 2 + -8 = -8$$

$$3. -2 + 6 + -1 = 3$$

$$8. -2 + 3 + 9 + -5 = 5$$

$$4. 12 + -8 + -2 = 2$$

$$9. -12 + 16 + -2 + 12 + -9 = 7$$

$$5. -9 + -1 + -3 + -6 = -19$$

$$10. 14 + -11 - 7 + -4 + -3 = -11$$

#### Applications

1.

When Sam woke up, the temperature was  $-3^{\circ}$  F. By lunchtime, the temperature had increased by  $8^{\circ}$ . By the time Sam arrived home from school at 3:00 PM, the temperature had increased by  $1^{\circ}$ . By the time Sam went to bed at 10:00 PM, the temperature had fallen  $7^{\circ}$ .

a. What was the temperature at lunchtime?

$$-3 + 8 = 5^{\circ}$$

b. What was the temperature at 10:00 PM when Sam went to bed?

$$5 + 1 = 6 - 7 = -1^{\circ}$$

2.

It will be  $-12^{\circ}$  tonight. The weatherman predicts it will be  $25^{\circ}$  warmer by noon tomorrow. What will the temperature be by noon tomorrow?

$$-12 + 25 = 13^{\circ}$$

3.

While watching a football game, Lin Chow decided to list yardage gained as positive integers and yardage lost as negative integers. After these plays, Lin recorded 14,  $-7$ , and 9. What was the net gain or loss?

$$14 - 7 + 9 = 16 \text{ yds}$$

**Scenario:** At the beginning of this game, you have a bank account balance of \$15.

Question: - How much do you have at the end?

$$15 + 8 - 6 - 7 - 10 + 1 - 3 + 10 - 8 = 80$$

**You deposit \$8 into your bank account.**

**You take \$6 out of your account to buy a snack.**

**You take \$7 out of your account to buy books.**

**You take out \$10 from your account to go to the movies.**

**You find \$1 on the sidewalk and deposit it into your account.**

**You take \$3 out of your account to pay a library fine.**

**You deposit the \$10 your neighbor gave you for helping her with yard work.**

**You take \$8 out of your account to pay for the class field trip.**

## Week 5 Day 3 Multiplying and Dividing Integers

Students will multiply and divide integers without a calculator.

Warm up

Take a look at the examples below. What do you notice about the signs of the answers, compared to the signs in the problems?

$4 \times 2 = 8$
$4 \times -2 = -8$
$-4 \times -2 = 8$
$-4 \times 2 = -8$
$8 \div 4 = 2$
$-8 \div 4 = -2$
$8 \div 2 = 4$
$-8 \div 2 = -4$

Same sign = + answer  
different sign = - answer

### The Rules

1. Same sign – answer is positive.
2. Different signs – answer is negative.

Examples:

1)  $2 \cdot -6 = \underline{-12}$

2)  $-4(-3) = \underline{12}$

3)  $-7 \cdot 3 = \underline{-21}$

4)  $-12 \div -3 = \underline{4}$

5)  $\frac{18}{-9} = \underline{-2}$

6)  $-150 \div 50 = \underline{-3}$

7)  $3 \cdot (-2) \cdot (-1) \cdot (-4) = \underline{-24}$   
 $\quad \quad \quad \underbrace{\quad \quad} \quad \underbrace{\quad \quad}$   
 $\quad \quad \quad -6 \quad * \quad 4$

Practice:

- 1) Find the product:  $3(-3) = \underline{-9}$
- 2) Find the product:  $-5(10) = \underline{-50}$
- 3) Multiply:  $-8 \cdot -3 = \underline{24}$
- 4) Find the quotient:  $-15 \div 3 = \underline{-5}$
- 5) Simplify:  $(-5)(-4)(1)(5) = \underline{100}$
- 6) From sea level, a sting ray dives 30 feet in 1 minute. At this pace, at what depth will the sting ray be in 3 minutes?  $\underline{-90 \text{ feet}}$

## Extra Practice

1.  $3(-3) = \underline{-9}$
2.  $3(-12) = \underline{-36}$
3.  $7(-8) = \underline{-56}$
4.  $7 \cdot -7 = \underline{-49}$
5.  $-33 \div 11 = \underline{-3}$
6.  $\frac{-100}{-20} = \underline{5}$
7.  $-38 \div (-2) = \underline{19}$
8.  $9 \cdot -3 = \underline{-27}$
9.  $(-6)(10) = \underline{-60}$
10. Compare using  $>$ ,  $<$ , or  $=$ .  $-14 \div 2 \underline{=} 7 \cdot -1$   
 $\underline{-7} \qquad \underline{-7}$
11. Which of the following describes the value of the product when a **negative** integer is multiplied by a **negative** integer?  
 A. greater than zero  
 B. less than zero  
 C. equal to zero  
 D. It can be any of the above.
12. Which of the following expressions has a product of  $-48$ ?  
A.  $-8 \cdot 6$   
B.  $24(-2)$   
C.  $2 \cdot -6 \cdot 4$   
 D. All of the above

## Integer Operations Review

Name: \_\_\_\_\_

### Adding Integers

1)  $85 + (-96) = \underline{-11}$

2)  $80 + 57 = \underline{137}$

3)  $86 + (-38) = \underline{48}$

4)  $22 + (-41) = \underline{-19}$

5)  $-18 + (-45) = \underline{-63}$

6)  $-32 + 48 = \underline{16}$

7)  $6 + (-33) = \underline{-27}$

8)  $6 + (-47) = \underline{-41}$

9)  $(-78) + 69 = \underline{-9}$

10)  $-72 + (-30) + 10 = \underline{-92}$

11)  $-83 + (-36) + 20 = \underline{-99}$

### Subtracting Integers

1)  $1 - 3 = \underline{-2}$

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

3)  $6 - (-9) = \underline{15}$

4)  $-7 - (-1) = \underline{-6}$

5)  $-7 - 4 = \underline{-11}$

6)  $3 - (-2) = \underline{5}$

7)  $-1 - 9 = \underline{-10}$

8)  $2 - 9 = \underline{-7}$

9)  $-8 - (-1) = \underline{-7}$

### Multiplying Integers

1)  $(-4)(-12) = \underline{48}$

2)  $-8 \times (-8) = \underline{64}$

3)  $(-8)(-10) = \underline{80}$

4)  $5 \times 1 = \underline{5}$

5)  $(-10)(11) = \underline{-110}$

6)  $(-3)(-8) = \underline{24}$

7)  $-2 \times 6 = \underline{-12}$

8)  $7(-12) = \underline{-72}$

9)  $4 \times (-10) = \underline{-40}$

10)  $(-9)(-6)(2) = \underline{98}$

11)  $(-10)(-7)(-4) = \underline{-280}$

### Dividing Integers

1)  $-48 \div 6 = \underline{8}$

2)  $-81 \div (-9) = \underline{9}$

3)  $-18 \div (-6) = \underline{3}$

4)  $25 \div (-5) = \underline{-5}$

5)  $-10 \div 2 = \underline{-5}$

6)  $-35 \div (-5) = \underline{7}$

7)  $-42 \div 6 = \underline{-7}$

8)  $-70 \div (-7) = \underline{10}$

9)  $-16 \div (-8) = \underline{3}$