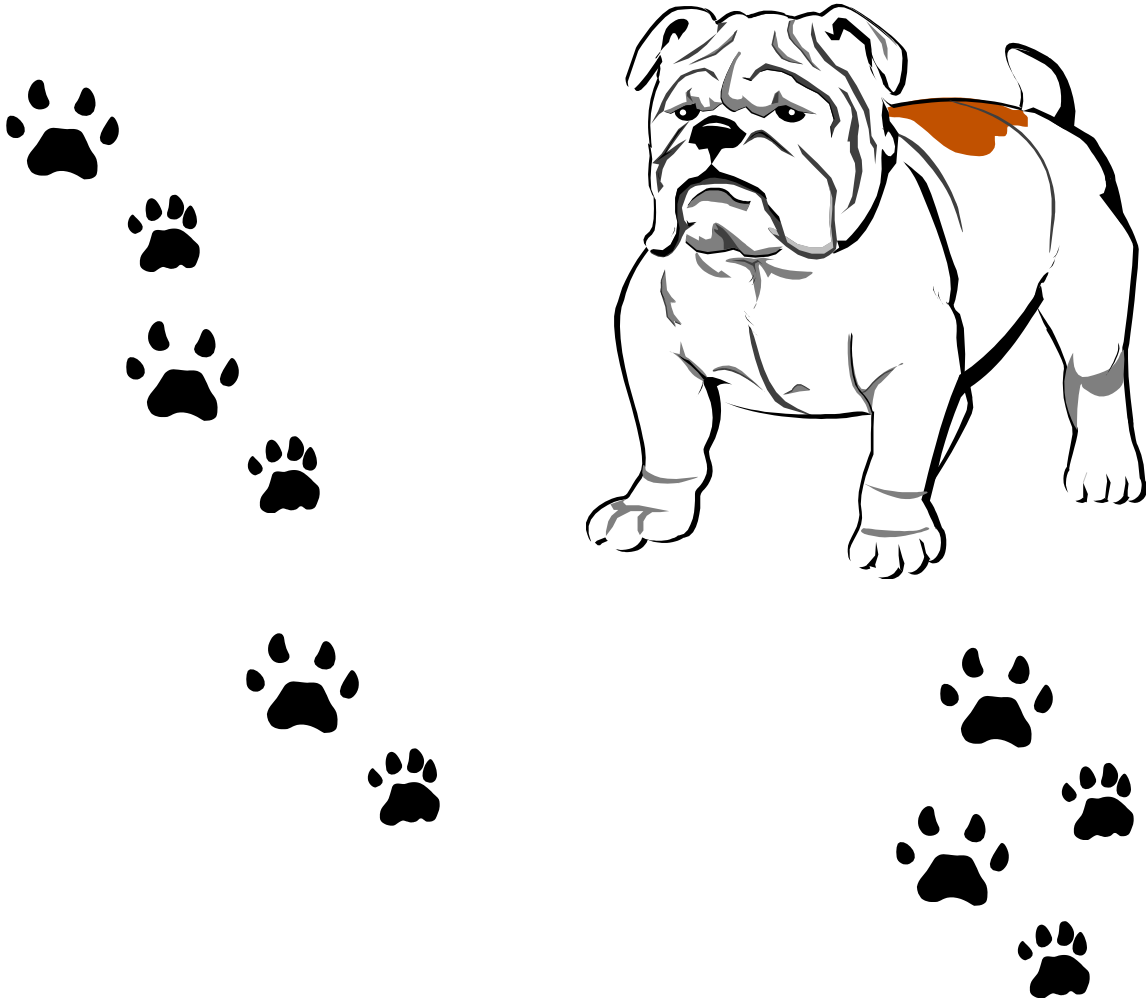


Student Name: \_\_\_\_\_



Say Hello to Algebra Prep/Investigations into Mathematics

For Students Entering Algebra Prep/IM

This summer math booklet was developed to provide students in middle school an opportunity to review grade level math objectives and to improve math performance.

## Say Hello to Algebra Prep/IM

One goal of Baker Middle School is to promote increased math performance at all grade levels. Completing the summer math booklet allows each student and parent within the school to work together to achieve this goal. Students who complete the summer math booklet will be able to:

- Increase retention of math concepts,
- Increase the level of proficiency on the Maryland School Assessment,
- Work toward closing the gap in student performance.

### Student Responsibilities

Students will be able to improve their math performance by:

- Completing the summer math booklet,
- Reviewing math skills throughout the summer.

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Student Signature

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Grade

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Date

### Parent Responsibilities

Parents will be able to promote student success in math by:

- Supporting the math goals of Baker Middle School,
- Monitoring student completion of the summer math booklet,
- Encouraging student use of math concepts in summer activities.

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Parent Signature

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Date

This summer math booklet was adapted by Missy Sigley, Math Resource Teacher at Baker Middle School from the "Sail into Summer with Math!" booklets and from *Introductory Algebra 6<sup>th</sup> Edition* by Keady/Bittinger, published Addison Wesley, 1991.

John T. Baker Middle School

## Adding Integers

### Hints/Guide:

Rules for Adding Integers:

1. Adding positive numbers – add the numbers and the answer is positive.
2. Adding negative numbers – add the numbers and the answer is negative.
3. Adding a positive and a negative number – **subtract** the numbers, then
  - if the greater number is positive, the answer is positive
  - if the greater number is negative, the answer is negative.

### Examples:

- 1)  $3 + 5 = 8$       two positive numbers: add the numbers and the answer is positive
- 2)  $-12 + (-7) = -19$       two negative numbers: add the numbers and the answer is negative
- 3)  $-36 + 21 = -15$       a negative and a positive: subtract the numbers and keep the sign of the greater number

Exercises: Follow the rules for adding integers to solve the problems.

1.  $-9 + 2$
2.  $2 + (-5)$
3.  $-10 + 6$
4.  $8 + (-3)$
5.  $-8 + 8$
6.  $6 + (-6)$
7.  $-3 + (-5)$
8.  $-4 + (-6)$
9.  $17 + (-17)$
10.  $-15 + 15$
11.  $-17 + (-25)$
12.  $-24 + (-17)$
13.  $8 + (-5)$
14.  $-7 + 8$
15.  $-4 + (-5)$

## Subtracting Integers

### Hints/Guide:

Rules for Subtracting Integers:

1. Change the subtraction to addition,
2. Change the sign of the number after the subtraction sign to the opposite:
  - if it is a positive number, make it negative
  - if it is a negative number, make it positive
3. Then follow the rules for addition.

### Examples:

- 1)  $2 - 6 = 2 + (-6) = -4$       change the subtraction to addition, and 6 to (-6)  
follow the rules for addition
- 2)  $4 - (-9) = 4 + 9 = 13$       change the subtraction to addition and (-9) to 9.  
follow the rules for addition
- 3)  $-7 - (-10) = -7 + 10 = 3$       change the subtraction to addition and (-7) to 7  
follow the rules for addition

Exercises: Follow the rules for subtracting integers to solve the problems.

1.  $3 - 7$

2.  $4 - 9$

3.  $0 - 7$

4.  $0 - 10$

5.  $-8 - (-2)$

6.  $-6 - (-8)$

7.  $-10 - (-10)$

8.  $-6 - (-6)$

9.  $12 - 16$

10.  $14 - 19$

11.  $20 - 27$

12.  $30 - 4$

13.  $-9 - (-3)$

14.  $-7 - (-9)$

15.  $8 - (-3)$

## Multiplying Integers

### Hints/Guide:

Rules for Multiplying Integers:

- a positive number times a positive number equals a positive number  
**positive • positive = positive**
- a negative number times a negative number equals a positive number  
**negative • negative = positive**
- a positive number times a negative number equals a negative number  
**positive • negative = negative**  
**negative • positive = negative**

### Examples:

- 1)  $3 \cdot 6 = 18$       positive times a positive equals a positive
- 2)  $-3 \cdot (-6) = 18$       negative times a negative equals a positive
- 3)  $3 \cdot (-6) = -18$       positive times a negative equals a negative
- 4)  $-3 \cdot 6 = -18$       negative times a positive equals a negative

Exercises: Follow the rules for multiplying integers to solve the problems.

1.  $-8 \cdot 2$

2.  $-2 \cdot 5$

3.  $-7 \cdot 6$

4.  $-9 \cdot 2$

5.  $8 \cdot (-3)$

6.  $9 \cdot (-5)$

7.  $-9 \cdot 8$

8.  $-10 \cdot 3$

9.  $-8 \cdot (-2)$

10.  $-2 \cdot (-5)$

11.  $-7 \cdot (-6)$

12.  $-9 \cdot (-2)$

13.  $15 \cdot (-8)$

14.  $-12 \cdot (-10)$

15.  $-14 \cdot 17$

## Dividing Integers

### Hints/Guide:

Rules for Dividing Integers (same as multiply):

- a positive number divided by a positive number equals a positive number  
**positive divided by positive = positive**
- a negative number divided by a negative number equals a positive number  
**negative divided by negative = positive**
- a positive number divided by a negative number equals a negative number  
**positive divided by negative = negative**  
**negative divided by positive = negative**

Examples: (fraction bar (/) means divide)

- 1)  $6 / -3 = -2$       positive divided by a negative equals a negative
- 2)  $-15 / -3 = 5$       negative divided by a negative equals a positive
- 3)  $-24 / 8 = -3$       negative divided by positive equals a negative

Exercises: Follow the rules for dividing integers to solve the problems.

1.  $36 / (-6)$

2.  $28 / (-7)$

3.  $26 / -2$

4.  $26 / (-13)$

5.  $-16 / 8$

6.  $-22 / (-2)$

7.  $-48 / (-12)$

8.  $-63 / (-9)$

9.  $-72 / 9$

10.  $-50 / 25$

11.  $-100 / (-50)$

12.  $-200 / 8$

13.  $-108 / 9$

14.  $-64 / (-7)$

15.  $200 / (-25)$

## Using Integer Rules While Adding Decimals

Hints/Guide:

Rules for Adding Integers:

1. Adding positive numbers – add the numbers and the answer is positive.
2. Adding negative numbers – add the numbers and the answer is negative.
3. Adding a positive and a negative number – **subtract** the numbers, then
  - if the greater number is positive, the answer is positive
  - if the greater number is negative, the answer is negative.

Examples:

- 1)  $8.5 + (-1.4) = 7.1$  positive and a negative -subtract the numbers and use the sign of the greater number
- 2)  $-9.2 + 3.1 = -6.1$  negative and a positive - subtract the numbers and use the sign of the greater number
- 3)  $-1.5 + (-1.5) = -3.0$  negative and negative - add the numbers and the make the answer negative

Exercises: Follow the rules for adding integers to solve the decimal problems. Remember to line up the decimals. Show all work.

1.  $0.7 + (-0.17)$

2.  $8.7 + (-6.4)$

3.  $-4.5 + (-3.2)$

4.  $-6.5 + 4.7$

5.  $-3.6 + 1.9$

6.  $-5.3 + (-2.8)$

7.  $-7.9 + (-6.5)$

8.  $24 + 3.1 + (-44) + (-8.2) + 63$

## Using Integer Rules While Subtracting Decimals

### Hints/Guide:

Rules for Subtracting Integers:

1. Change the subtraction to addition,
2. Change the sign of the number after the subtraction sign to the opposite:
  - if it is a positive number, make it negative
  - if it is a negative number, make it positive
3. Then follow the rules for addition.

### Examples:

- |  |   |
|--|---|
| 1) $-4.2 - (-3.6) = -4.2 + 3.6 = -0.6$ | change the subtraction to addition, and $(-3.6)$ to $3.6$<br>follow the rules for addition  |
| 2) $-12.4 - 10.9 = -12.4 + (-10.9)$    | change the subtraction to addition and $10.9$ to $(-10.9)$<br>follow the rules for addition |
| 3) $8.2 - (-6.1) = 8.2 + 6.1 = 14.3$   | change the subtraction to addition and $(-6.1)$ to $6.1$<br>follow the rules for addition   |

**Exercises:** Follow the rules for subtracting integers to solve the decimal problems. Remember to line up the decimals. Show all work.

1.  $-3.2 - 5.8$

2.  $-2.7 - 5.9$

3.  $0.99 - 1$

4.  $0.87 - 1$

5.  $-2.8 - 0$

6.  $6.04 - 1.1$

7.  $-10.53 + 7$

8.  $8 - (-9.3)$

9.  $-3.8 - 4.1$

10.  $3.1 - (-4.7)$

11.  $6.1 - (-13.8)$

12.  $1.5 - (-3.5)$

## Using Integer Rules While Multiplying Fractions

Hints/Guide:

Rules for Multiplying Integers:

- a positive number times a positive number equals a positive number  
**positive • positive = positive**
- a negative number times a negative number equals a positive number  
**negative • negative = positive**
- a positive number times a negative number equals a negative number  
**positive • negative = negative**  
**negative • positive = negative**

Examples:

$$1) \frac{-1}{3} \cdot \frac{5}{7} = \frac{-1(5)}{3(7)} = \frac{-5}{21}$$

multiply the numerators together (negative times positive = negative)  
multiply the denominators together (positive times positive = positive)

$$2) \frac{-5}{6} \cdot \frac{-1}{9} = \frac{-5(-1)}{6(9)} = \frac{5}{54}$$

multiply the numerators together (negative times negative = positive)  
multiply the denominators together (positive times positive = positive)

Exercises: Follow the rules for multiplying integers to solve the fraction problems. Show all work.

1.  $\frac{2}{3} \cdot \frac{-3}{5}$

2.  $\frac{5}{7} \cdot \frac{-2}{3}$

3.  $\frac{-3}{8} \cdot \frac{-2}{9}$

4.  $\frac{-5}{8} \cdot \frac{-2}{5}$

5.  $\frac{-5}{9} \cdot \frac{3}{4}$

6.  $\frac{-8}{3} \cdot \frac{9}{4}$

7.  $\frac{1}{5} \cdot \frac{-2}{9}$

8.  $\frac{-3}{5} \cdot \frac{-2}{7}$

9.  $\frac{-4}{5} \cdot \frac{10}{3}$

**Order of Operations**

Hints/Guide:

REMEMBER: Order of Operations

(PEMDAS)

P - parenthesis

E - exponents

M/D - multiply/divide which comes first left to right

A/S - add/subtract which comes first left to right

**Remember to simplify the top of the fraction then bottom of the fraction.**

Examples:

$$\begin{aligned} 1) \quad 15 - 2 \cdot 5 + 3 &= 15 - 10 + 3 \\ &= 5 + 3 \\ &= 8 \end{aligned}$$

multiply first  
subtract  
add

$$\begin{aligned} 2) \quad 5[4 + (8 - 2)] &= 5[4 + 6] \\ &= 5(10) \\ &= 50 \end{aligned}$$

parenthesis first  
add because of parenthesis  
multiply

Exercises: Simplify the following expressions. Show all work.

1.  $7 + 2 \cdot 6$

2.  $11 + 4 \cdot 4$

3.  $8 \cdot 7 + 6 \cdot 5$

4.  $10 \cdot 5 + 1 \cdot 1$

5.  $19 - 5 \cdot 3 + 3$

6.  $14 - 2 \cdot 6 + 7$

7.  $6[9 + 3(3 + 4)]$

8.  $8[(13 + 6) - 11]$

9.  $8 + (7 + 9)$

10.  $(8 + 7) + 9$

11.  $15(4 + 2)$

12.  $15 \cdot 4 + 15 \cdot 2$

13. 
$$\frac{100 - 15}{9 + 8}$$

14. 
$$3 + 4[13 - 2(6 - 3)]$$

15. 
$$5[2(8 + 5) - 15]$$

16. 
$$14 + 6 \cdot 2 - 8 \div 4$$

17. 
$$\frac{7(14) - 3(6)}{2}$$

18. 
$$14 \div [3(8 - 2) - 11]$$

Use parenthesis to make each equation true.

19. 
$$6 + 8 \div 4 \cdot 2 = 7$$

20. 
$$5 + 4 \cdot 3 - 1 = 18$$

## Evaluating Expressions

Hints/Guide:

REMEMBER: Order of Operations

(PEMDAS)

P - parenthesis

E - exponents

M/D - multiply/divide which comes first left to right

A/S - add/subtract which comes first left to right

**Remember to simplify the top of the fraction then bottom of the fraction.**

Examples:

1) Evaluate  $x + y$  for  $x = 37$  and  $y = 29$ 

$$\begin{aligned} x + y \\ 37 + 29 \\ 66 \end{aligned}$$

2) Evaluate  $\frac{3y}{6}$  for  $y = 14$ 

$$\frac{3y}{6} = \frac{3(14)}{6} = \frac{42}{6} = 7$$

Exercises: Evaluate the following expressions. Show all work.

1.  $6x$  for  $x = 7$

2.  $7y$  for  $y = 7$

3.  $\frac{3p}{q}$  for  $p = 2$  and  $q = 6$

4.  $\frac{5y}{z}$  for  $y = 15$  and  $z = 25$

5.  $\frac{x+y}{5}$  for  $x = 10$  and  $y = 20$

6.  $\frac{p+q}{2}$  for  $p = 2$  and  $q = 16$

7.  $\frac{x-y}{8}$  for  $x = 20$  and  $y = 4$

8.  $\frac{m-n}{5}$  for  $m = 16$  and  $n = 6$

# Parent Packet

**Answers to Adding Integers (page 3):**

- 1) -7      2) -3      3) -4      4) 5      5) 0      6) 0      7) -8  
8) -10      9) 0      10) 0      11) -42      12) -41      13) 3      14) 1  
15) -9

**Answers to Subtracting Integers (page 4):**

- 1) -4      2) -5      3) -7      4) -10      5) -6      6) 2      7) 0  
8) 0      9) -4      10) -5      11) -7      12) 26      13) -6      14) 2  
15) 11

**Answers to Multiplying Integers (page 5):**

- 1) -16      2) -10      3) -42      4) -18      5) -24      6) -45      7) -72  
8) -30      9) 16      10) 10      11) 42      12) 18      13) -120      14) 120  
15) -238

**Answers to Dividing Integers (page 6):**

- 1) -6      2) -4      3) -13      4) -2      5) -2      6) 11      7) 4  
8) 7      9) -8      10) -2      11) 2      12) -25      13) -12      14)  $64/7$   
15) -8

**Answers to Using Integer Rules While Adding Decimals (page 7):**

- 1) 0.53      2) 2.3      3) -7.7      4) -1.8      5) -1.7      6) -8.1      7) -14.4  
8) 37.9

**Answers to Using Integer Rules While Subtracting Decimals (page 8):**

- 1) -9      2) -8.6      3) -0.01      4) -0.13      5) -2.8      6) 4.94      7) -3.53  
8) 17.3      9) -7.9      10) 7.8      11) 19.9      12) 5

**Answers to Using Integer Rules While Multiplying Fractions (page 9):**

- 1)  $-2/5$     2)  $-10/21$     3)  $1/12$     4)  $\frac{1}{4}$     5)  $-5/12$     6)  $-6$     7)  $-2/45$
- 8)  $6/35$     9)  $-8/3$

**Answers to Order of Operations (page 10 and 11):**

- 1) 19    2) 27    3) 86    4) 51    5) 7    6) 9    7) 180
- 8) 64    9) 24    10) 24    11) 90    12) 90    13) 5    14) 31
- 15) 55    16) 24    17) 40    18) 2    19)  $6 + [8 \div (4 \cdot 2)] = 7$
- 20)  $(5 + 4) \cdot (3 - 1) = 18$

**Answers to Evaluating Expressions (page 12):**

- 1) 42    2) 49    3) 1    4) 3    5) 6    6) 9    7) 2
- 8) 2