

At-Home Practice**1A Expressions and Integers****Evaluate each expression for the given value(s) of the variable.**

1. $8(x + 7)$ for $x = 17$

2. $6m - 7n$ for $m = 12$ and $n = 7$

Write an algebraic expression for each word phrase.

3. a number decreased by 5

4. the product of a number and 9, less 4

Use properties to determine whether the expressions are equivalent.

5. $3(12 + b)$ and $36 + 3b$

6. $3 + y \cdot 4$ and $y + 3 \cdot 4$

Add.

7. $-3 + 8$

8. $-4 + (-5)$

9. $6 + (-9)$

10. $12 + (-7)$

Evaluate each expression for the given value of the variable.

11. $t + 8$ for $t = -12$

12. $b + (-5)$ for $b = 3$

13. $x + 11$ for $x = -19$

Subtract.

14. $-9 - 7$

15. $15 - (-3)$

16. $-19 - (-4)$

17. $32 - (-17)$

18. The temperature was 3° below zero at 6 P.M. Six hours later the temperature fell another 18° . What was the temperature at midnight?

Multiply or divide.

19. $-3(6)$

20. $-4(-5)$

21. $\frac{60}{-12}$

22. $16(-2)$

Simplify.

23. $12(8 - 12)$

24. $-6(-3 + 7)$

25. $11 + 3(4 - 9)$

26. $7 - 8(4 + 6)$

Answers: 1. 192 2. 23 3. $n - 5$ 4. $9n - 4$ 5. equivalent 6. not equivalent 7. 5 8. -9 9. -3 10. 5 11. -4 12. -2
13. -8 14. -16 15. 18 16. -15 17. 49 18. -21° 19. -18 20. 20 21. -5 22. -32 23. -48 24. -24 25. -4 26. -73

Dear Family,

The student will be learning about equations and inequalities. Initially, he or she will be evaluating algebraic expressions that contain up to two variables. When given the values of the variables, simply “substitute” those values for the intended variable and then simplify the expression. This skill will help the student check his or her answers when solving equations.

Another skill the student will be reviewing is writing algebraic expressions in place of word phrases. Examples of the four basic operations and some key phrases that may help the student write these algebraic expressions are listed below.

Operation	Key Word Phrases	Expression
Addition	add 6 to a number sum of 6 and a number 6 more than a number	$6 + m$
Subtraction	subtract 3 from a number 3 less than a number difference of a number and 3	$m - 3$
Multiplication	8 times a number the product of a number and 8	$8m$
Division	2 divided into a number quotient of a number and 2	$m \div 2$ or $\frac{m}{2}$

The student needs to be very familiar with the four basic operations and how each operation works. These operations, along with the properties of numbers shown below, allow expressions to be simplified. This is a basic building block for solving equations, another concept the student will be learning in this chapter.

Properties		
Words	Numbers	Algebra
Commutative Property	$5 + 6 = 6 + 5$ $4(7) = 7(4)$	$a + b = b + a$ $ab = ba$
Associative Property	$4 + (1 + 6) = (4 + 1) + 6$ $8 \cdot (3 \cdot 7) = (8 \cdot 3) \cdot 7$	$a + (b + c) = (a + b) + c$ $a(bc) = (ab)c$
Distributive Property	$2(4 + 5) = 2(4) + 2(5)$ $5(6 - 3) = 5(6) - 5(3)$	$a(b + c) = ab + ac$ $a(b - c) = ab - ac$

Vocabulary

These are the math words we are learning:

absolute value the distance a number is from zero on a number line

algebraic expression an expression with one or more variables

coefficient the number multiplied by the variable

conjecture a guess based on reasoning

constant a value that does not change

counterexample an example that disproves a conjecture, or shows that it is false

evaluate to find the value of a numerical or algebraic expression

integers the set of whole numbers and their opposites

opposites two numbers that are an equal distance from zero on a number line; also known as **additive inverses**

substitute replace a variable in an algebraic expression with a number

variable a letter that represents a value that can change or vary

The student will be learning about a special set of numbers called integers. The set of integers includes the set of whole numbers and their opposites.

Number lines will be used to introduce the idea of “opposite” numbers. The opposite of a number is the same distance from 0 on a number line as the given number. In mathematics, this is called absolute value, designated by the symbol $| |$.

Absolute value is always positive; $|7| = 7$
 it denotes distance from zero, $|-7| = 7$
 and distance cannot be negative.

The student will learn how to add, subtract, multiply, and divide integers by following a few important, simple guidelines.

- If the signs are the same, add the absolute values. Use the same sign.

$$\begin{array}{ll} -6 + -3 & \text{The signs are the same, so } |-6| + |-3| = 9. \\ -9 & \text{Use the sign of the integers.} \end{array}$$

- If the signs are different, subtract the absolute values. Use the sign of the integer with the greater absolute value.

$$\begin{array}{ll} -5 + 4 & \text{The signs are different, so } |-5| - |4| = 1. \\ -1 & |-5| > |4|, \text{ so the sign is negative.} \end{array}$$

The strategies used for addition can be applied to subtraction. To subtract integers, change the subtraction sign to an addition sign and then *add the opposite* of what is shown.

Multiplying and dividing integers is similar to multiplying and dividing whole numbers, except that the product/quotient has a sign. Below are guidelines to determine the answer’s sign.

- If the integers have the same sign, the product or the quotient will **ALWAYS** be positive.

$$\begin{array}{ll} -4(-6) & \text{The signs are the same, so the answer is} \\ 24 & \text{positive.} \end{array}$$

- If the integers have different signs, the product or quotient will **ALWAYS** be negative.

$$\begin{array}{ll} -4(6) & \text{The signs are different, so the answer is} \\ -24 & \text{negative.} \end{array}$$

Practice mental math games to help sharpen his or her skills with integers.

Sincerely,

CHAPTER

1

Family Fun

Integer Cards

Materials

Deck of regular playing cards
Score pad and pencil

Directions

- Shuffle the cards. Each card has a value.
 - **All** of the black cards are positive integers.
 - **All** of the red cards are negative integers.
- The face cards have special qualities:
 - Jacks are multiplied by the value of 2.
 - Queens are multiplied by the value of 5.
 - Kings are multiplied by the value of 10.
- Each player starts out with 100 points.
- Each round consists of each player being dealt 2 cards, finding the sum of those integers, and then adding this integer to their total, beginning with 100. If a face card is dealt, the player must find the product of the two cards and then add the new integer to the player's total score.
- Record the total after each round under your name on the score pad.
- The goal is to be the player with the lowest positive score after 10 rounds.

Round				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				