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Study Guide and Intervention

7NS1.2, 7AF1.3

Multiplying and Dividing Integers

Use the following rules to determine whether the product or quotient of two integers is positive or negative.

- The product of two integers with different signs is negative.
- The product of two integers with the same sign is positive.
- The quotient of two integers with different signs is negative.
- The quotient of two integers with the same sign is positive.

Example 1 **Find $7(-4)$.**

$7(-4) = -28$ **The factors have different signs. The product is negative.**

Example 2 **Find $-5(-6)$.**

$-5(-6) = 30$ **The factors have the same sign. The product is positive.**

Example 3 **Find $15 \div (-3)$.**

$15 \div (-3) = -5$ **The dividend and divisor have different signs. The quotient is negative.**

Example 4 **Find $-54 \div (-6)$.**

$-54 \div (-6) = 9$ **The dividend and divisor have the same sign. The quotient is positive.**

Exercises

Multiply or divide.

1. $8(-8)$ **−64** **2.** $-3(-7)$ **21** **3.** $-9(4)$ **−36** **4.** $12(8)$ **96**

5. $33 \div (-3)$ **−11** **6.** $-25 \div 5$ **−5** **7.** $48 \div 4$ **12** **8.** $-63 \div (-7)$ **9**

9. $(-4)^2$ **16** **10.** $\frac{-75}{15}$ **−5** **11.** $-6(3)(-5)$ **90** **12.** $\frac{-143}{-13}$ **11**

Evaluate each expression if $a = -1$, $b = 4$, and $c = -7$.

13. $3c + b$ **−17** **14.** $a(b + c)$ **3** **15.** $c^2 - 5b$ **29** **16.** $\frac{a - 6}{c}$ **1**

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Study Guide and Intervention

7AF1.1, 7AF1.3, 7AF1.4

Simplifying Algebraic Expressions

The **Distributive Property** can be used to simplify algebraic expressions.

Examples **Use the Distributive Property to rewrite each expression.**

1 **$3(a + 5)$**

$3(a + 5) = 3(a) + 3(5)$ Distributive Property
$= 3a + 15$ Simplify.

2 **$-2(d - 3)$**

$-2(d - 3) = -2[d + (-3)]$ Rewrite $d - 3$ as $d + (-3)$.
$= -2(d) + (-2)(-3)$ Distributive Property
$= -2(d) + 6$ Simplify.

When a plus sign separates an algebraic expression into parts, each part is called a **term**. In terms that contain a variable, the numerical part of the term is called the **coefficient** of the variable. A term without a variable is called a **constant. Like terms** contain the same variables, such as $3x$ and $2x$.

Example 3 **Identify the terms, like terms, coefficients, and constants in the expression $7x - 5 + x - 3x$.**

$7x - 5 + x - 3x = 7x + (-5) + x + (-3x)$ Definition of subtraction
$= 7x + (-5) + 1x + (-3x)$ Identity Property; $x = 1x$

The terms are $7x$, -5, x, and $-3x$. The like terms are $7x$, x, and $-3x$. The coefficients are 7, 1, and -3. The constant is -5.

An algebraic expression is in **simplest form** if it has no like terms and no parentheses.

Example 4 **Simplify the expression $-2m + 5 + 6m - 3$.**

$-2m$ and $6m$ are like terms. 5 and -3 are also like terms.

$-2m + 5 + 6m - 3 = -2m + 5 + 6m + (-3)$ Definition of subtraction
$= -2m + 6m + 5 + (-3)$ Commutative Property
$= (-2 + 6)m + 5 + (-3)$ Distributive Property
$= 4m + 2$ Simplify.

Exercises

Use the Distributive Property to rewrite each expression.

1. $2(c + 6)$ **$2c + 12$**

2. $-4(w + 6)$ **$-4w - 24$**

3. $(b - 4)(-3)$ **$-3b + 12$**

4. Identify the terms, like terms, coefficients, and constants in the expression $4m - 2 + 3m + 5$. **terms: $4m$, -2, $3m$, 5; like terms: $4m$, $3m$ and -2, 5; coefficients: 4, 3; constants: -2, 5**

Simplify each expression.

5. $3d + 6d$ **$9d$**

6. $2 + 5s - 4$ **$5s - 2$**

7. $2z + 3 + 9z - 8$ **$11z - 5$**