

1-3 Reteaching

Algebraic Expressions

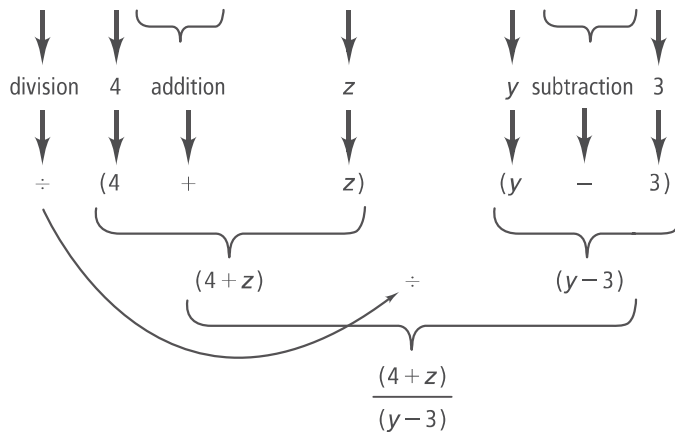
You can model words with algebraic expressions. In a word problem, look for words and word phrases that indicate mathematical operations.

Addition	Subtraction	Multiplication	Division
added to	subtracted from	multiplied by	divided by
plus	minus	product	quotient
sum	difference	times	fraction of
more than	less than	of	per
longer than	shorter than		
increased by	decreased by		
total	fewer than		
in all			

Problem

What is an algebraic expression that models the given word phrase?

The quotient of 4 more than the number z and the number y decreased by 3



Exercises

Write an algebraic expression that models each word phrase.

- nine less than 5 multiplied by the number p $5p - 9$
- the product of 2 divided by the number h and 8 more than the number k $\left(\frac{2}{h}\right)(k + 8)$
- two decreased by the quotient of the number a and 7 and increased by a multiplied by 3
 $2 - \frac{a}{7} + 3a$

1-3 Reteaching (continued)

Algebraic Expressions

To simplify an algebraic expression, combine like terms using the basic properties of real numbers. Like terms have the same variables raised to the same powers.

To evaluate an algebraic expression, replace the variables in the expression with numbers and follow the order of operations.

Problem

What is the value of the algebraic expression $3(4x + 5y) - 2(3x - 7y)$ when $x = 3$ and $y = -2$?

Simplify the algebraic expression using the basic properties of real numbers.

$$\begin{aligned}
 3(4x + 5y) - 2(3x - 7y) &= 12x + 15y - 2(3x - 7y) && \text{Distributive Property for Addition} \\
 &= 12x + 15y - (6x - 14y) && \text{Distributive Property for Subtraction} \\
 &= 12x + 15y - 6x + 14y && \text{Opposite of a Difference} \\
 &= 12x - 6x + 15y + 14y && \text{Identify like terms.} \\
 &= (12 - 6)x + (15 + 14)y && \text{Distributive Property} \\
 &= 6x + 29y && \text{Combine like terms.}
 \end{aligned}$$

Evaluate the expression, replacing x with 3 and y with -2 in the simplified expression.

$$\begin{aligned}
 &6(3) + 29(-2) \\
 &= 18 - 58 \\
 &= -40
 \end{aligned}$$

Exercises

Simplify the algebraic expression. Then evaluate the simplified expression for the given values of the variable.

- | | |
|--|---|
| 4. $(4x + 1) + 2x$; $x = 3$
$6x + 1$; 19 | 5. $7(t + 3) - 11$; $t = 4$
$7t + 10$; 38 |
| 6. $3y + 4z + 6y - 9z$; $y = 2$, $z = 1$
$9y - 5z$; 13 | 7. $2(u + v) - (u - v)$; $u = 8$, $v = -3$
$u + 3v$; -1 |
| 8. $5a^2 + 5a + a + 1$; $a = -2$
$5a^2 + 6a + 1$; 9 | 9. $6p^2 - (3p^2 + 2q^2)$; $p = 1$, $q = 5$
$3p^2 - 2q^2$; -47 |
| 10. $\frac{3}{4}(m + n) - \frac{1}{4}(m - n)$; $m = 6$, $n = 2$
$\frac{1}{2}m + n$; 5 | 11. $\frac{r}{2} + \frac{s}{3} - \frac{r}{4} + \frac{1}{5}$; $r = -1$, $s = 0$
$\frac{r}{4} + \frac{s}{3} + \frac{1}{5}$; $-\frac{1}{20}$ |