Algebra 1.1

Write verbal expressions for algebraic expressions
Write algebraic expressions for verbal expressions

algebraic expression
variable
term
factor
product
power
exponent base

Key Concept

Translating Verbal to Algebraic Expressions

Operation	Verbal Phrases
Addition	more than, sum, plus, increased by, added to
Subtraction	less than, subtracted from, difference, decreased by, minus
Multiplication	product of, multiplied by, times, of
Division	quotient of, divided by

$p \cdot 6$

$6 \cdot p = 6p$

$\dfrac{1}{3} \cdot a = \dfrac{1}{3}a$

Check Your Progress

2A. the product of p and 6

2B. one third of the area a

An expression like x^n is called a **power** and is read "x to the nth power." The variable x is called the **base**, and n is called the **exponent**. The exponent indicates the number of times the base is used as a factor.

Symbols	Words	Meaning
3^1	3 to the first power	$3 \quad = 3^1$
3^2	3 to the second power or 3 squared	$3 \cdot 3$
3^3	3 to the third power or 3 cubed	$3 \cdot 3 \cdot 3$
3^4	3 to the fourth power	$3 \cdot 3 \cdot 3 \cdot 3$
$2b^6$	2 times b to the sixth power	$2 \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b$
x^n	x to the nth power	$\underbrace{x \cdot x \cdot x \cdot \ldots \cdot x}_{n \text{ factors}}$

$x \cdot x \cdot x \cdot x$

By definition, for any nonzero number x, $x^0 = 1$.

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5 = 32$$

Example 2 **Write Algebraic Expressions with Powers**

Write each expression algebraically.

a. the product of 7 and m
   to the fifth power

   $7m^5$

b. the difference of 4 and
   x squared

   $4 - x^2$

$$7m^5$$

$$4 - x^2$$

GeMA

To **evaluate** an expression means to find its value.

Example 3 **Evaluate Powers**

Evaluate each expression.

a. $2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64$

$8 \qquad 8$

Whiteboards

Write an algebraic expression for each verbal expression.

11. the sum of 35 and z

12. the sum of a number and 7

13. the product of 16 and p

14. the product of 5 and a number

15. 49 increased by twice a number

16. 18 and three times d

17. two-thirds the square of a number

18. one-half the cube of n

Evaluate each expression.

21. $6^2 = 6 \cdot 6 = 56$ 22. $8^2 = 8 \cdot 8 = 64$ 23. 3^4 $3 \cdot 3 \cdot 3 \cdot 3 = 81$ 24. $6^3 = 6 \cdot 6 \cdot 6 = 216$

25. 3^5 26. 15^3 27. 10^6 28. 100^3

$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 =$ $15 \cdot 15 \cdot 15 =$ $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$ $100 \cdot 100 \cdot 100$

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Matching activ