

# Study Guide

## Variables and Expressions

Any letter used to represent an unspecified number is called a variable. You can use variables to translate verbal expressions into algebraic expressions.

Words	Symbols
4 more than a number	$x + 4$
a number decreased by 8	$b - 8$
the product of 5 and a number	$5c$
a number divided by 8	$h \div 8$ or $\frac{h}{8}$
a number squared	$y^2$

The algebraic expression  $x^n$  represents a product in which each factor is the same. The small raised  $n$  is the exponent and it tells how many times the base,  $x$ , is used as a factor.

**Example:** Evaluate  $3^4$ .

$$\begin{aligned} 3^4 &= 3 \cdot 3 \cdot 3 \cdot 3 \\ &= 81 \end{aligned}$$

**Write a verbal expression for each algebraic expression.**

1.  $w - 1$

2.  $\frac{1}{3}a^3$

3.  $81 + 2x$

**Write an algebraic expression for each verbal expression.**

4. a number decreased by 5

5. four times a number

6. 8 less than a number

7. a number divided by 6

8. a number multiplied by 37

9. the sum of a number and 9

10. 3 less than 5 times a number

11. twice the sum of 15 and a number

12. 7 more than the product of 6 and a number

13. 30 increased by 3 times the square of a number

**Write each expression as an expression with exponents.**

14.  $7 \cdot 7 \cdot 7$

15.  $3 \cdot p \cdot p$

16.  $9(b)(b)(b)(b)(b)$

**Evaluate each expression.**

17.  $2^3$

18.  $10^5$

19.  $4^4$