1-1 Variables and Expressions

Vocabulary

A mathematical quantity is anything that can be measured or counted. Some quantities remain constant. Others change, or vary, and are called *variable quantities*.

Algebra uses symbols to represent quantities that are unknown or that vary. You can represent mathematical phrases and real-world relationships using symbols and operations.

A variable is a symbol, usually a letter, that represents the value(s) of a variable quantity. An algebraic expression is a mathematical phrase that includes one or more variables. A numerical expression is a mathematical phrase involving numbers and operation symbols, but no variables.

Examples

1. What is an algebraic expression for the word phrase?
   a. 32 more than an number *n*

   b. 58 less than a number *n*

   c. 58 less a number *n*

2. What is an algebraic expression for the word phrase?
   a. 8 times a number *n*

   b. the quotient of a number *n* and 5

Got It?

1. What is an algebraic expression for 18 more than a number?

2. What is an algebraic expression for each word phrase in (a) and (b)?
   a. 6 times a number *n*

   b. the quotient of 18 and a number

   c. Do the phrases "*6 less a number y*" and "*6 less than a number y*" mean the same thing? Explain.

More Examples

3. What is an algebraic expression for the word phrase?
   a. 3 more than twice a number *x*

   b. 9 less than the quotient of 6 and a number

   c. the product of 4 and the sum of a number and 7

Got It?

3. What is an algebraic expression for ...
   a.
   b.
   c.

More Examples

4. What word phrase can you use to represent the algebraic expression $3x$?

   Expression: $3x$ (means 3 times x)

   Words: _____ or _____

Got It?

4. What word phrase can you use to represent ...

   a. _____ b. _____

   c. _____ d. _____

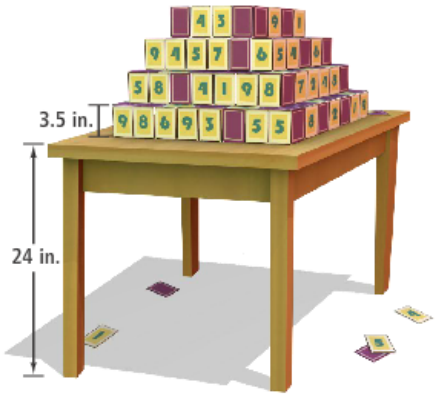
More Examples (#5)

Hobbies The table below shows how the height above the floor of a house of cards depends on the number of levels.

A What is a rule for the height? Give the rule in words and as an algebraic expression.

House of Cards

Number of Levels	Height (in.)
2	(3.5 • 2) + 24
3	(3.5 • 3) + 24
4	(3.5 • 4) + 24
n	?



Know
Numerical expressions for the height given several different numbers of levels

Need
A rule for finding the height given a house with *n* levels

Plan
Look for a pattern in the table. Describe the pattern in words. Then use the words to write an algebraic expression.

Rule in Words

Rule as an Algebraic Expression

More Examples (#5 continued)

B A group of students built another house of cards that had 10 levels. Each card was 4 inches tall, and the height from the floor to the top of the house of cards was 70 inches. How tall would the house of cards be if they built an 11th level?

C Another group of students built a third house of cards with n levels. Each card was 5 inches tall, and the height from the floor to the top of the house of cards was $34 + 5n$ inches. How tall would the house of cards be if the group added 1 more level of cards?

HW: Practice WS 1-1: 1-19 odd, 21-27 all

Alg1 wk1 Tues HW: 1-19 ODDS and 21-27 ALL

Name_____ Class_____ Date_____

1-1 Practice *Form G*

Variables and Expressions

Write an algebraic expression for each word phrase.

1. 10 less than x

2. 5 more than d

3. 7 minus f

4. the sum of 11 and k

5. x multiplied by 6

6. a number t divided by 3

7. one fourth of a number n

8. the product of 2.5 and a number t

9. the quotient of 15 and y

10. a number q tripled

11. 3 plus the product of 2 and h

12. 3 less than the quotient of 20 and x

Write a word phrase for each algebraic expression.

13. $n + 6$

14. $5 - c$

15. $11.5 + y$

16. $\frac{x}{4} - 17$

17. $3x + 10$

18. $10x + 7z$

Write a rule in words and as an algebraic expression to model the relationship in each table.

19. The local video store charges a monthly membership fee of \$5 and \$2.25 per video.

Videos (v)	Cost (c)
1	\$7.25
2	\$9.50
3	\$11.75