LESSON 1.1

Expressions *and* Variables

BEFORE | *Now* | **WHY?**

You evaluated numerical expressions.

You'll evaluate and write variable expressions.

So you can find the amount left on a gift card, as in Ex. 39.

Vocabulary

numerical expression,

A **numerical expression** consists of numbers and operations. In the table, the expression 4 • 10 is a numerical expression. It can also be written as 4 × 10 or 4(10).

3.8

A **variable** is a letter used to represent one or more numbers. A **variable expression** consists of numbers, variables, and operations.

One way you can use a variable expression is to generalize a pattern, as in the table. The variable expression 4 • d represents the amount of food a blue whale can eat in d days. You can also write 4 • d as 4d.

To **evaluate** a variable expression, substitute a number for each variable and evaluate the resulting numerical expression.

3x

3(2)

6

Writing Variable Expressions You can solve a real-world problem by creating a *verbal model* and using it to write a variable expression. A **verbal model** describes a problem using words as labels and using math symbols to relate the words. The table shows common words and phrases that indicate mathematical operations.

Common Words and Phrases that Indicate Operations

Addition	Subtraction	Multiplication	Division
plus the sum of increased by total more than added to	minus the difference of decreased by fewer than less than subtracted from	times the product of multiplied by of	divided by divided into the quotient of

LESSON 1.1

Name _____ Date _____

Practice A

For use with pages 5–9

Evaluate the expression when $x = 5$.

1. $x + 6$

2. $21 - x$

21-X

21-5

16

3. $9x$

9.5

45

4. $\frac{20}{x}$

5. $12 + x$ **6.** $36 - x$ **7.** $10x$ **8.** $\frac{35}{x}$

Evaluate the expression when $a = 4$ and $b = 3$.

9. $a - b$ **10.** $a + 6$ **11.** ab **12.** $\frac{9}{b}$

4-3
1

4.3
12

13. $\frac{28}{a}$ **14.** $7b$ **15.** $64 - b$ **16.** $13 + a$

$\frac{28}{4}$

7

64 3

61

Write a variable expression to represent the phrase.

17. The sum of a number and 7 $x+7$

18. 11 fewer than a number

19. The quotient of a number and 6

20. A number times 8

21. 5 less than a number

22. 5 divided into a number

19) $\frac{y}{6}$

21) $w-5$

23. You can evaluate the expression $112 - p$ to find the number of pencils you have left from a package of 112 pencils after you have distributed p pencils among your classmates. Find the number of pencils left over after distributing 56 pencils.

$112 - p$

$112 - 56$

56

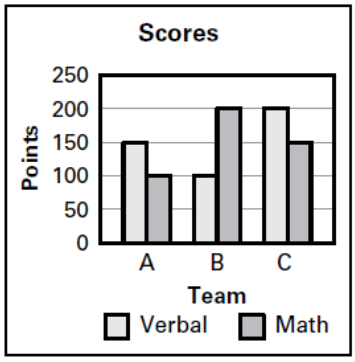
24. You buy 5 shirts each having the same price. Write a variable expression for the total amount you spend on the shirts. How much money do you spend on the shirts when each shirt costs $15?

$5x$

$5(15)$

$\$75$

In Exercises 25–27, use the double bar graph that shows three teams' scores in an academic competition. A team's final score is the sum of the points for the verbal section *v* and the math section *m*.



25. Write a variable expression for a team's final score. $v+m$

26. Find each team's final score.

27. Another team earns 175 points in the verbal section. At least how many points must the team earn in the math section to have a higher final score than teams A, B, and C?

$v+m$

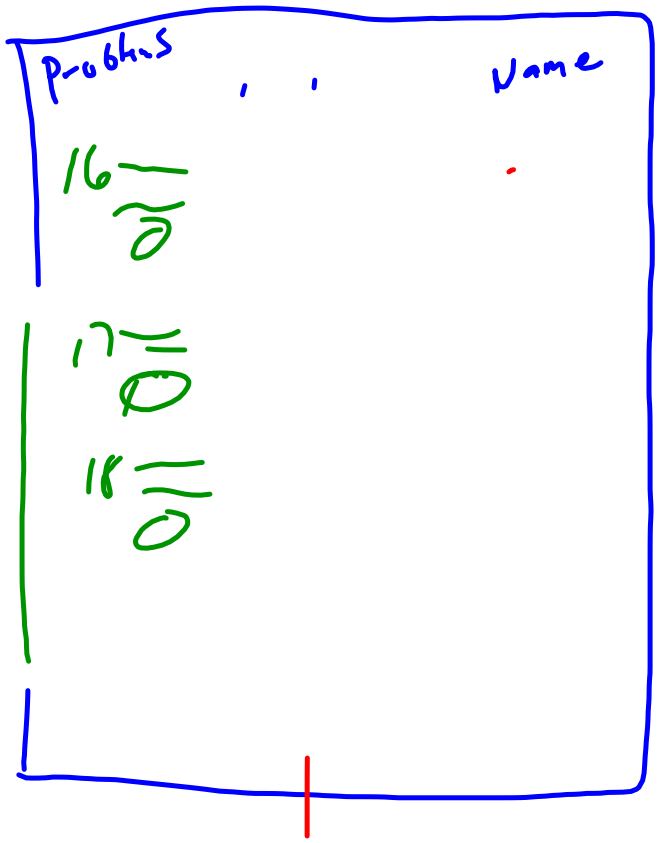
A) $150+100$ 250

B) $100+200$ 300

C) $200+150$ 350

$350 - 175 = 175$

given + 175 pts


Problems
Name
16
17
18