

HW

LESSON 5 Variables and Equations

An algebraic expression is a mathematical *phrase* containing at least one variable.

$3y + 7$ is an algebraic expression. Expressions do not have an equals sign.

An **equation** is an algebraic *sentence* that shows how 2 expressions are equal.

$3y + 7 = 10$ is an equation.

When writing equations use a letter that helps you remember what the variable means.

Example

At a comic book fair, Blake sold 4 brand-new comics and 6 used comics for a total of \$170. He received \$35 for each brand-new comic. Write an equation that shows how much he got for each used comic.

STEP 1 Write a sentence that describes what you know.

Four brand-new comics at \$35 each; plus 6 used comics for some unknown amount; total = \$170

Plus means and.

STEP 2 Choose a letter to stand for the variable, or unknown quantity.

Let u stand for the selling price of a used comic.

Use a letter that helps you remember what the variable means. The u here is for used.

STEP 3 Write an equation.

4 brand-new comics for \$35 each	plus	6 used comics for some amount	equals	\$170
$4(35)$	$+$	$6u$	$=$	170

The equation is $4(35) + 6u = 170$

ON YOUR OWN

The height of a picture frame is 8 in. The frame is 1.5 times as wide as it is high. Write an equation to find the width of the frame.

Practice

Building Skills

Write an equation.

1. A number subtracted from 12 is equal to 5.
2. The sum of a number and 17 is 32.
3. The difference between a number and 3 is 8.
4. The product of a number and 5 is 30.
5. The quotient of a number divided by 8 is equal to 12.
6. When you multiply a number by 3 and then add 7 the total is 19.
7. Five times (a number minus 12) is equal to 28.
8. A number added to 5.8 gives a total of 9.2.
9. Three less than the quotient of a number divided by 4 is equal to 6.
10. Forty-four is 4 more than the product of a number and 8.

Problem Solving

Write an equation.

11. The width of a cornfield plus 8 meters makes 73 meters.
12. The length of a rectangular swimming pool is 20 ft longer than the width of the pool, which is 15 ft.
13. Marco tutored a younger student for 45 min, which is 12 min less than Leanne tutored her student.
14. The movie ran 164 min, which was 14 min more than 10 times the length of the previews.
15. A state produced just 100 T of wheat over half what it produced last year. The amount last year was 150,000 T.
16. In 2 years, Kelly's age will be 75% of Laverne's age. Kelly is now 13.