

Chapter 27

EXPRESSIONS

In math, an **EXPRESSION** is a mathematical phrase that contains numbers, **VARIABLES** (letters or symbols used in place of a quantity we don't know yet), and/or operators (such as $+$ and $-$).

EXAMPLES:

$$x + 5$$

$$3m - 2$$

$$\frac{a}{-b}$$

$$44k$$

$$59 + -3$$

Sometimes, an expression allows us to do calculations to find out what quantity the variable is.

EXAMPLE: When Georgia runs, she runs a 6-mile loop each day. We don't know how many days she runs, so we'll call that number " d ." So, now we can say that Georgia runs $6d$ miles. (In other words, $6d$ is the expression that represents how much Georgia runs each week.)

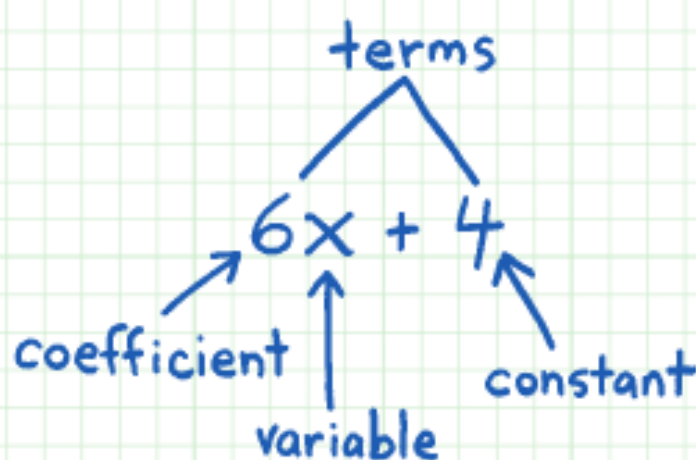
When a number is attached to a variable, like $6d$, you multiply the number and the variable. Any number that is used to multiply a variable (in this case 6) is called the **COEFFICIENT**.

A **CONSTANT** is a number that stays fixed in an expression (it stays "constant"). For example, in the expression $6x + 4$, the constant is 4 .

An expression is made up of one or more **TERMS**—a number by itself or the product of a number and variable (or more than one variable). Each term is separated by an addition calculation symbol. In the expression $6x + 4$, there are two terms: $6x$ and 4 .

TERM

a number by itself or the product of a number and variable(s). Terms in a math sentence are separated by a $+$ or $-$ symbol.



EXAMPLE: Name the variable, terms, coefficient, and constant of $8y - 2$.

The variable is y .

The terms are $8y$ and 2 .

The coefficient is 8 .

The constant is -2 .

HUH? You might have thought terms were always separated by an addition symbol... **BUT** if you're adding a negative number, the $+$ becomes a $-$! Keep an eye out for $+$ and $-$ when looking for terms in an expression.

Operators tell us what to do. Addition ($+$), subtraction ($-$), multiplication (\times), and division (\div) are the most common operators. Word problems that deal with expressions use words instead of operators. Here's a quick translation:

OPERATION	OPERATOR	KEYWORDS
sum	$+$	greater than more than plus added to increased by

OPERATION	OPERATOR	KEYWORDS
difference	-	less than decreased by subtracted from fewer
product	x	times multiplied by of
quotient	÷	divided by per

EXAMPLE: "14 increased by g " = $14 + g$

EXAMPLE: "17 less than h " = $h - 17$

(Be careful! Anytime you are translating "less than," the second number in the word problem is written first in the expression!)

EXAMPLE: "The product of -7 and x " = $-7 \cdot x$

This can also be written $(-7)(x)$ or $-7(x)$ or $-7x$.

EXAMPLE: "The quotient of 99 and w " = $99 \div w$

This can also be written $\frac{99}{w}$.



CHECK YOUR KNOWLEDGE

For 1 through 3, name the variable(s), coefficient(s), and/or constant(s), if applicable.

1. $3y$

2. $5x + 11$

3. $-52m + 6y - 22$

For 4 and 5, list the terms.

4. $2,500 + 11t - 3w$

5. $17 + d(-4)$

For 6 through 10, write the expression.

6. 19 less than y

7. The quotient of 44 and 11

8. The product of -13 and k

9. Katherine drives 27 miles to work each day. Last Wednesday, she had to run some errands and drove a few extra miles. Write an expression that shows how many miles she drove on Wednesday. (Use x as your variable.)
10. There is a hip-hop dance contest on Saturday nights at a club. Because there was a popular DJ playing, the organizers expected 2 times the amount of people. The organizers also invited an extra 30 people from out of town. Write an expression that shows how many people they can expect to come to the event. (Use x as your variable.)

CHECK YOUR ANSWERS



1. Variable: y ; Coefficient: 3; No constants
2. Variable: x ; Coefficient: 5; Constant: 11
3. Variables: m, y ; Coefficients: -52, 6; Constant: -22
4. 2,500, $11t$, $-3w$
5. 17, $d(-4)$
6. $y - 19$
7. $44 \div 11$ or $\frac{44}{11}$
8. $-13k$
9. $27 + x$
10. $2x + 30$