Write An Algebraic Expression For Each Phrase

MASTER THE SKILL: WRITE AN ALGEBRAIC EXPRESSION FOR EACH PHRASE

Algebra is often described as the language of mathematics, and like any language, it requires translation. One of the first and most critical skills students encounter is the ability to **write an algebraic expression for each phrase** they read. Whether you are calculating the cost of groceries with a coupon or determining the distance traveled on a road trip, the ability to convert everyday language into a mathematical expression is fundamental. This article serves as a comprehensive guide to mastering this translation process, offering clear explanations, step-by-step strategies, and plenty of examples to build your confidence. By the end, you will not only understand how to write an algebraic expression for each phrase but also appreciate why this skill is the bedrock of problem-solving in both academics and real life.

WHAT EXACTLY IS AN ALGEBRAIC EXPRESSION?

Before you can translate a phrase, you must understand what you are building. An algebraic expression is a combination of numbers, variables (letters that represent unknown values), and mathematical operations such as addition, subtraction, multiplication, and division. Unlike an equation, an expression does not contain an equals sign; it is simply a mathematical phrase. For example, $3x + 5$ is an algebraic expression. When you **write an algebraic expression for each phrase**, you are essentially converting the words of that phrase into this compact, symbolic language.

WHY LEARNING TO TRANSLATE PHRASES MATTERS

The ability to **write an algebraic expression for each phrase** is more than a classroom exercise. It is a practical skill used in budgeting, engineering, computer programming, and data analysis. When you read a problem that says, "five less than twice a number," you need to translate that into $2x - 5$ before you can solve it. Without this translation step, word problems remain confusing blocks of text. Mastering this process allows you to:

- Solve complex word problems systematically.
- Communicate mathematical ideas clearly.
- Build a strong foundation for algebra, calculus, and beyond.
- Improve logical thinking and pattern recognition.

UNDERSTANDING THE KEY COMPONENTS OF A PHRASE

Every phrase you encounter will contain two essential elements: numbers or variables, and operation words. Identifying these parts is the first step when you **write an algebraic expression for each phrase**.

Numbers and Variables

Numbers are usually straightforward. Variables, however, are used to represent an unknown quantity. The most common variable is x, but any letter works. If a phrase says "a number" or "some number," you should use a variable. If the phrase specifies a particular number, like "seven," you use the digit 7.

Operation Words to Know

Mathematics has its own vocabulary. Here is a quick reference list you will use every time you **write an algebraic expression for each phrase**:

- **Addition:** sum, plus, more than, added to, increased by, total of.
- **Subtraction:** difference, minus, less than, subtracted from, decreased by, fewer than.
- **Multiplication:** product, times, multiplied by, of (as in "half of"), twice, thrice.
- **Division:** quotient, divided by, per, ratio of, split evenly.
- **Exponents:** squared, cubed, to the power of.

STEP-BY-STEP GUIDE: HOW TO WRITE AN ALGEBRAIC EXPRESSION FOR EACH PHRASE

To ensure accuracy every time, follow this simple process. It works for both simple and complex phrases.

1. **Read the phrase carefully.** Do not rush. Identify the unknown quantity and assign it a variable.
2. **Look for the operation words.** Circle or underline words like "sum," "less than," or "product."
3. **Determine the order carefully.** This is the most common source of error. For example, "five less than a number" is $x - 5$, not $5 - x$.
4. **Translate piece by piece.** Build the expression in parts, then combine them.

5. **Check your work.** Read your expression back as a phrase. Does it match the original wording?

COMMON PHRASES AND THEIR TRANSLATIONS

Let us look at a variety of phrases and how to **write an algebraic expression for each phrase** correctly. These examples range from elementary to intermediate.

Simple Addition and Subtraction Phrases

- "A number plus seven" becomes **x + 7**.
- "The sum of a number and twelve" becomes **n + 12**.
- "Ten more than y" becomes **y + 10**.
- "A number decreased by four" becomes **x - 4**.
- "Six less than a number" becomes **n - 6**. Notice the order: the number comes first in the expression, even though "less than" is written first in the phrase.
- "The difference between twenty and a number" becomes **20 - x**.

Multiplication and Division Phrases

- "The product of eight and a number" becomes **8x** or **8 * x**.
- "Twice a number" becomes **2x**.
- "Half of a number" becomes **(1/2)x** or **x / 2**.
- "The quotient of a number and five" becomes **x / 5**.
- "A number divided by three" becomes **n / 3**.

Combined Operation Phrases

These require you to **write an algebraic expression for each phrase** that contains more than one operation.

- "Five more than twice a number" becomes **2x + 5**.
- "Three less than the product of four and a number" becomes **4x - 3**.
- "The sum of a number and six, divided by two" becomes **(x + 6) / 2**. Parentheses are crucial here.
- "Seven times the difference of a number and nine" becomes **7(x - 9)**.

Phrases with Exponents

- "The square of a number" becomes **x^2**.
- "A number cubed, plus five" becomes **$x^3 + 5$**.
- "Three times a number squared" becomes **$3x^2$**. This is different from $(3x)^2$, which is "the square of three times a number."

DEEP DIVE: TRICKY PHRASES THAT CONFUSE STUDENTS

Even after you understand the basics, certain phrases require extra attention. When you **write an algebraic expression for each phrase**, watch out for these common traps.

The "Less Than" Trap

This is the most frequently missed translation. The phrase "a number less than ten" means you start with ten and subtract the number: `10 - x`. However, "ten less than a number" means you start with the number and subtract ten: `x - 10`. Always reverse the order when you see "less than."

Subtracted From vs. Subtracted By

"Five subtracted from a number" is `x - 5`. The number comes first. "A number subtracted from five" is `5 - x`. The number after "from" comes first in the expression.

Phrases Using "Of"

In math, "of" usually indicates multiplication. "Half of a number" is `(1/2)x` or `x/2`. "One third of a number" is `(1/3)x`. Be careful to include parentheses when needed.

Consecutive Number Phrases

If a phrase says "the sum of two consecutive integers," you need to define the first integer as *x* and the second as *x + 1*. The expression is `x + (x + 1)` or `2x + 1`.

REAL-WORLD APPLICATIONS: TRANSLATING WORD PROBLEMS

The ultimate test of your ability to **write an algebraic expression for each phrase** comes when you face a word problem. Here are a few scenarios that demonstrate how this skill is used outside the textbook.

Scenario 1: Shopping

You buy a shirt that costs *d* dollars. You have a coupon for $5 off. The total cost is *d - 5*. If you buy three shirts, the expression for the total is *3d - 5* or *3(d - 5)*, depending on whether the coupon applies to the total or each shirt. Translating the phrase correctly is essential to getting the right answer.

Scenario 2: Travel

A car travels at a speed of *s* miles per hour for 4 hours. The distance traveled is *4s*. If the car then travels an additional 30 miles, the total distance is *4s + 30*. Each part of the story becomes a part of the expression.

Scenario 3: Geometry

If a rectangle has a length that is 3 feet more than twice its width *w*, you can **write an algebraic expression for each phrase** to describe the length: *2w + 3*. The perimeter then becomes *2(2w + 3) + 2w*, which simplifies to *6w + 6*.

PRACTICE PROBLEMS TO SHARPEN YOUR SKILLS

Now it is your turn. Try to **write an algebraic expression for each phrase** below. Use the variable *x* for the unknown number.

1. Seven increased by a number.
2. Twelve decreased by a number.
3. The product of nine and a number.
4. A number divided by six.
5. Four more than three times a number.
6. The difference between a number and ten, multiplied by five.
7. Eight less than the quotient of a number and two.
8. Six times the sum of a number and four.
9. A number squared, increased by seven.
10. Half of a number, decreased by eleven.

Answer Key

1. `x + 7`
2. `12 - x`
3. `9x`
4. `x / 6`
5. `3x + 4`
6. `5(x - 10)`
7. `(x / 2) - 8`