Literal Translations in Algebra

Words used in math problems often (but don't always) suggest a specific mathematical operation. The following list may be helpful. Words followed by * must have the number order reversed (e.g. 5 less than 8 is written 8 – 5).

Words that **may** mean to use the operation of **addition**:
sum, more, plus, added to, add, total, greater than, larger than, longer than, more than, older than, higher than, increased by

Words that **may** mean to use the operation of **subtraction**:   *reverse items
difference, subtract, from*, taken from*, less, **less than***, minus, decreased by, smaller than*, shorter than*, younger than*, take away, diminished by

Words that **may** mean to use the operation of **multiplication**:
product, multiply, times, twice (2), double (2), triple (3), of(with fractions), per

Words that **may** mean to use the operation of **division**:   *reverse numbers
quotient, division, divided by, into*, divided into*, over

Words that **may** mean **equals**:
is, are, equals, results in, answer, is the same as, yields

Words that **may** mean **begin a set of parentheses**:
sum of, difference of, difference between, product of, quotient of, the quantity, which is, and the answer is, and this value is,

To do these, follow the following steps:

1. Copy the sentence, **double-spaced**.
2. Mark it in the following ways:
    a. **Line-out** numbers and variables, and write them below
    b. **Circle** *operation words* and write them below. Note reversals (*)
    c. **Underline** the *operation phrases*, **with arrow to "and."** (see next page)
3. Rewrite the translated sentence as translated, clean it up, and simplify.

Operation Phrases

When you see the following phrases, they are each identifying an operation that you are to do on two or more items. The first item begins after the "**of**" (or between) until the "**and**." The "**and**" stands for the operation, and the second item is described after the "**and**." At first, you should enclose these operation phrases in parentheses. Later you can decide if those parentheses are needed.

Operation Phrase	First Item	Operation	Second Item	Algebraic Form
The **sum of**	(*a number*	**(+)** **and**	*thirty-two)*	(*x* + 32)
The **difference of**	(*twice a number*	**(-)** **and**	*sixteen)*	(2*x* − 16)
The **product of**	(*fifteen*	**(*)** **and**	(*two less than a number*))	[15(*x* − 2)]
The **quotient of**	(*six more than* *a number*	**(/)** **and**	*four)*	$\dfrac{6+x}{4}$

Structure/ Template

Operation Phrase	First Item	And	Second Item	Algebraic Form