

Verbal Problems

Objective: To translate a verbal expression into a variable expression.

Addition	added to	6 added to y	$y + 6$
	more than	8 more than x	$x + 8$
	the sum of	the sum of x and z	$x + z$
	increased by	t increased by 9	$t + 9$
	the total of	the total of 5 and a number	$5 + n$
Subtraction	minus	x minus 2	$x - 2$
	less than	7 less than a number	$n - 7$
	decreased by	m decreased by 3	$m - 3$
	difference between	the difference between y and 4	$y - 4$
Multiplication	times	10 times a number	$10n$
	of	one half of x	$\frac{1}{2}x$
	the product of	the product of y and z	yz
	multiplied by	y multiplied by 11	$11y$
	twice	twice a number	$2n$
Division	divided by	x divided by 12	$x/12$
	the quotient of	the quotient of y and z	y/z
Power	the square of	the square of a number	n^2
	the cube of	the cube of t	t^3
	to the __ power	x to the eighth power	x^8

Part I - Translating into variable expressions...

1. Fourteen more than the cube of x.
2. 18 less than twice a number
3. the product of q and seventeen
4. four-fifths of the difference between w and 10
5. the total of 12 and six times a number
6. seventeen less than the cube of x

Objective: Representing Two Unknowns in terms of a Single Variable.

Many times, it's helpful to express two different unknowns in terms of a single variable. A few examples to demonstrate. When solving problems that contain multiple unknowns, it's always beneficial to explicitly state, in algebraic terms, how the unknowns are represented.

Example 1. A number is three less than another number ...

What are the unknowns? the two numbers.

Let the larger number = x ,

then, the smaller number =

Example 2. I have twice as many nickels as quarters ...

What are the unknowns?

Example 3. The sum of two numbers is 12 ...

What are the unknowns?

Objective: Translating and Solving Equations

Translating equations is no more difficult than translating expressions. Some hints for translating equations:

1. find the equal sign first. This will be indicated by the phrase "is", or "is the same as", etc...
2. translate the **easier** side of the equation next.
3. translate the other side.
4. solve the resulting equation.

For example, translate and solve:

1. *Fifteen less than a number is five more than twice that number.*

2. *Six more than the product of x and five is equal to twenty-one.*

3. *The difference between a number and three is one more than twice that number.*

4. Recall, from the previous page, example 3: "*The sum of two numbers is 12 ...*", what if *3 times the first number is equal to 2 times the second?*