Solving Word Problems

Applications or word problems are the very life of mathematics! They are the reason for doing mathematics because they teach you how to put to use the mathematical skills you have developed. Learning mathematics without ever doing word problems is similar to learning all the skills of a sport without ever playing a game or learning all the notes on an instrument without ever playing a song.

How to solve word problems:

1. Understand the problem. Pick out important information and write it down. Draw any charts, diagrams or pictures that will help you visualize the problem.

2. Identify the unknown variables. Try substitution to limit the problem to one variable. Include units of measure.

3. Create an equation for the problem. Solve the equation. Check over the problem again to be sure you have found all the solutions the question asks for. Check to see if your answer works and makes sense. Don't forget the units on your answer!

Common Terms			Translation
Sum	Sum of	Plus	
Added to	Increased by	More than	$+$
	And		
Minus	Decreased by	Difference	
Diminished by	Less Difference between		$-$
In reverse order:	Less than		
	Subtracted from		
Of	Multiplied by		
Product	Product of		$\cdot$
Divided by	Ratio		
Quotient	Per		$\div$
Equals	Is equal to	Will be	
Is	Is as much as		$=$
The result is	Is the same as		

Addition Phrases	Translation
the sum of a number and four four more than a number a number increased by four	$x + 4$

Subtraction Phrases	Translation
the difference between x and 5 five less than a number a number decreased by five five subtracted from a number	$x - 5$
the difference between five and x five decreased by a number a number subtracted from 5	$5 - x$

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Multiplication Phrases	Translation
the product of a number and seven seven multiplied by a number	7x
seven percent of a number	0.07x
78% of x	0.78x

Division Phrases	Translation
the quotient of a number and four the ratio of x to four a number divided by 4	$\dfrac{x}{4}$
the quotient of 4 and a number 4 divided by a number 4 per every x	$\dfrac{4}{x}$

Mixed Phrases	Translation
the sum of twice a number and four four more than twice a number	2x + 4
twice the sum of a number and five	2(x + 5)
seven less than three times a number	3x – 7
six subtracted from five times a number	5x - 6
twice the square of a number	$2x^2$
the square of twice a number	$(2x)^2$
the square of the sum of x and y	$(x + y)^2$
the sum of the squares of x and y	$x^2 + y^2$
three more than twice the difference between a number and four	3 + 2(x - 4)
six less than four times the sum of two and a number	4(2 + x) - 6

Consecutive Integer Phrases	Translation
sum of three consecutive integers	n + (n + 1) + (n + 2)
sum of three consecutive even/odd integers	n + (n + 2) + (n + 4)
product of two consecutive even or odd integers	n(n + 2)

Fractional & Square Root Phrases	Translation
three-fourths of a number	$\dfrac{3}{4}x$
one-third the sum of a number and two	$\dfrac{1}{3}(x + 2)$
half the result of decreasing a number by three	$\dfrac{1}{2}(x - 3)$
a fraction whose denominator is two more than its numerator	$\dfrac{x}{x + 2}$
the square root of seven less than a number	$\sqrt{x - 7}$
one more than the square root of a number	$\sqrt{x} + 1 \quad or \quad 1 + \sqrt{x}$