

Solving Word Problems

Applications or word problems are the very life of mathematics! They are the reason for doing mathematics, as they teach you how to put into 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 song.

How to solve word problems:

- Step 1) Understand the problem, pick out all important information and write it down.
Draw any charts diagrams or pictures that will help you visualize the problem.
- Step 2) Identify the unknown variables, try substitution to limit problem to one variable.
Include units of measure.
- Step 3) Create an equation for the problem and solve. Check over the problem again to be sure you have found all the solutions it asks for, check to see if your answer works and makes sense.

| Common Terms | Translations |
|--|---------------------|
| -sum -sum of -plus -added to -increased by -more than -and | Addition |
| -minus -less than (reverse order) -less -diminished by -difference -difference between -subtracted from (reverse order) -decreased by | Subtraction |
| -times -of -product -product of -multiplied by | Multiplication |
| -divided by -quotient of -ratio -per | Division |

| | |
|-----------------|---|
| -equals | |
| -is | |
| -is equal to | |
| -is as much as | = |
| -is the same as | |
| -the result is | |
| -will be | |

Addition phrases

| | |
|------------------------------|---------|
| the sum of a number and four | |
| four more than a number | $x + 4$ |
| a number increased by four | |

Subtraction phrases

| | |
|-----------------------------------|---------|
| the difference between y and five | |
| five less than a number | $y - 5$ |
| a number decreased by five | |
| five subtracted from a number | |

the difference between five and y
 five decreased by a number

Multiplication phrases

| | |
|----------------------------|---------|
| the product of seven and x | $7x$ |
| seven multiplied by x | |
| seven percent of x | $0.07x$ |

78% of x

Mixed phrases

| | |
|---|-------------|
| the sum of twice a number and four | $2y + 4$ |
| four more than twice a number | |
| twice the sum of a number and five | $2(x + 5)$ |
| seven less than three times a number | |
| six subtracted from five times a number | $5y - 6$ |
| twice the square of a number | $2x^2$ |
| the square of twice a number | |
| 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 a difference between
a number and four

$$3 + 2(y - 4)$$

six less than four times the sum of two and
a number

Consecutive Integer phrases

sum of three consecutive integers

$$n + (n + 1) + (n + 2)$$

sum of three consecutive even integers

$$n + (n + 2) + (n + 4)$$

sum of three consecutive odd integers

sum of squares of three consecutive even or
odd integers

$$n^2 + (n + 2)^2 + (n + 4)^2$$

product of two consecutive even or odd integers

$$n(n + 2)$$

square of the sum of two consecutive integers

$$(n + n + 1)^2$$

Fractional phrases

three-fourths a number

$$(3/4)t$$

one-third the sum of a number and two

$$(1/3)(a + 2)$$

three-eighths of the difference between five and
a number

half the result of decreasing a number by three

$$(1/3)(y - 3)$$

a fraction whose denominator is two more than
its numerator

$$N/(N + 2)$$

a fraction such that the sum of its numerator and
denominator is eighteen

Square Root phrases

the square root of seven less than a number

$$\sqrt{z - 7}$$

one more than the square root of a number

the square root of the product of two consecutive
integers

$$\sqrt{[x + (x + 1)]}$$