

Solving Equations



What is an Equation?

An equation is a statement where the values of two mathematical expressions are equal.

$$2 + 5 = 7$$

is a simple equation.

$$2 + 5 = 8 - 1$$

is an equation with a calculation either side of the equals sign.

Can you write some equations with a calculation either side of the equals sign? Have a partner check them.

Equations with an Unknown Number

Often equations are written with an unknown number.

Sometimes we write $6 + 5 = \underline{\quad}$

The $\underline{\quad}$ represents an unknown number.

There is only one solution: $6 + 5 = 11$

The unknown number can also be written as part of a calculation:

$$13 - \underline{\quad} = 7$$

Here, the solution is that the unknown number is 6.

$$13 - 6 = 7$$

Using a Letter to Represent an Unknown

Unknown numbers in an equation can be represented by a letter.

We can write $4 + 9 = a$

The a represents an unknown number.

There is only one solution: $4 + 9 = 13$,
so $a = 13$

The unknown number as a letter can also
be written as part of a calculation: $n + 8 = 15$

Here the solution is that $n = 7$
 $7 + 8 = 15$

Solve These Equations

Solve these equations by finding the value of the letter that represents the unknown number:

$$a + 6 = 19 \qquad a = 13$$

$$25 = 41 - b \qquad b = 16$$

$$18 + c = 41 - 12 \qquad c = 11$$

$$23 + 14 = d - 8 \qquad d = 45$$

$$4 \times e = 20 \qquad e = 5$$

$$f \div 7 = 6 \qquad f = 42$$

Write some of your own equations for a partner.

Answers

Equations with 2 Unknowns

Equations can also be written with more than 1 unknown.
These would be represented by 2 different letters.

Can you think of 2 numbers that add up to 12?

This could be written $a + b = 12$

Write down some solutions in this format:

$a = 2$ and $b = 10$.

There are 13 different solutions when only using positive whole numbers.
Did you find them all? (a can be from 12 to 0).

Remember, both a and b can represent the same number, but are still different letters: $a + b = 12$, $6 + 6 = 12$, $a = 6$ and $b = 6$

Solve These Equations

Solve these equations by finding 3 different solutions for each equation:

$a + b = 10$ ($a = 9, b = 1$) pairs of numbers that add up to 10

$c - d = 4$ ($c = 5, d = 1$) pairs of numbers with a difference of 4

$9 + e = f$ ($e = 1, f = 10$) pairs of numbers with a difference of 9

$gh = 12$ ($g = 3, h = 4$) pairs of numbers whose product is 12

$9i = j$ ($i = 2, j = 18$) j is 9 times i

