Age word problems

Age word problems are like number word problems. We'll still need to translate problem statements in English to mathematical notation (variables, expressions, equations), use mathematics to solve the problems, and answer the specific questions about people's ages that were asked in the problem statements. In this lesson we'll look at how to do that.

One helpful way to organize these types of problems is by making a table.

Let's do a few examples.

Example

In 18 years, Sasha will be four times as old as she is now. How old is she now?

In 18 years, Sasha's age will be four times her current age, so we can relate her age now, which we'll denote by s, to her age in 18 years, which is $4s$.

So we can write the equation $s + 18 = 4s$.

We can also organize the information by making a table.

	Sasha	Equation
Now	s	
Future	s+18, her age in 18 years 4s, four times her current age	s+18=4s

Now solve for s in the equation.

$$s + 18 = 4s$$

$$s - s + 18 = 4s - s$$

$$18 = 3s$$

$$6 = s$$

Sasha is 6 now, and in 18 years she'll be 24, which is four times her current age: $24 = 4 \cdot 6$.

Let's do an example with more than one person.

Example

April is 12 years older than Eric. In 5 years, April will be twice as old as Eric. How old are Eric and April now?

Because April is 12 years older than Eric, we can write

$$A = E + 12$$

In 5 years, April's age will be $A+5$ and Eric's age will be $E+5$. At that time, April will be twice as old as Eric, so, we need to double Eric's age in 5 years to get April's age in 5 years. The next equation is

$$2(E+5)=A+5$$

This is a table that summarizes their ages and our equations:

	Eric	April	More info	Equation
Age now	E	A	April is 12 years older than Eric	A=E+12
Age in 5 years	E+5	A+5	April is twice as old as Eric	2(E+5)=A+5

Now we can substitute $E+12$ for A in the equation $2(E+5)=A+5$ and then solve for E.

$$2(E+5)=A+5$$

$$2(E+5)=(E+12)+5$$

$$2E+10=E+17$$

$$E=7$$

Substitute the value we found for E into the equation $A=E+12$, and then compute the value of A.

$$A=E+12$$

$$A=7+12$$

$$A=19$$

Right now, Eric is 7 and April is 19. Note that in 5 years, Eric will be 12 and April will be 24, so at that time April will indeed by twice as old as Eric: $24 = 2 \cdot 12$.
