



## Problem of the Week

### Problem A and Solution

### Family Facts

#### Problem

Myra has a school project to describe her family. As part of this, she wants to find out the ages of all the people in her family.

Myra knows that the following facts are true today.

Myra is 9 years old.

Myra's sister Vivienne is 3 years older than her.

Myra was 2 years old when her baby brother Jacob was born and today is Jacob's birthday.

Myra's mother Aven is 36 years old and her father Pierce is 5 years older than her mother.

Myra's grandmother Teagan was 55 years old when Jacob was born.

Myra's grandfather John was 49 when Vivienne was born and they have the same birthday.

What are the ages of everyone in Myra's family today?



## Solution

Since Myra is 9 years old and Vivienne is 3 years older, then Vivienne is  $9 + 3 = 12$  years old today.

Since Myra was 2 years old when Jacob was born and today is Jacob's birthday, then Jacob is  $9 - 2 = 7$  years old today.

Since Aven is 36 years old and Pierce is 5 years older, then Pierce is  $36 + 5 = 41$  years old today.

Since Teagan was 55 years old when Jacob was born and we know that was 7 years ago, then Teagan is  $55 + 7 = 62$  years old today.

Since John was 49 years old when Vivienne was born on his birthday and Vivienne is 12 years old today, then John is  $49 + 12 = 61$  years old today.

In summary, the ages of everyone in Myra's family today are as follows.

- Myra's brother Jacob is 7 years old.
- Myra is 9 years old.
- Myra's sister Vivienne is 12 years old.
- Myra's mother Aven is 36 years old.
- Myra's father Pierce is 41 years old.
- Myra's grandfather John is 61 years old.
- Myra's grandmother Teagan is 62 years old.



## Teacher's Notes

In math word problems we often see some extraneous information that is used to make the text more interesting. This means that we need to determine what facts are necessary to solve the problem. In this problem there are some details that may seem unnecessary, but they are actually critically important to calculating the definitive answer.

There would be more than one possible answer to this problem if we did not know that it was Jacob's birthday today. Suppose we did not know that today was Jacob's birthday. Knowing that Myra was 2 years old when Jacob was born is not enough information to know how old Jacob is on other days of the year. For example, if her birthday was one day after Jacob's and today was Myra's birthday, then Myra's age today would actually be 3 years more than Jacob's age.

When we are solving problems, we want them to be *deterministic*. This means there is a single, correct solution and we can be confident that we have the right answer. Unfortunately, real life problems do not always fall into this category.