

**Answer on question #39920, Math, Algebra.**

A man is 42 years old and his son is 12 years old. In how many years will the age of the son be half the age of the man at that time? Explain! It is a linear equation problem.

**Solution:**

The majority of age problems include the present ages of two or more persons, in addition to their ages at particular past and/or future times. The key to solving these problems is to translate the verbiage into equations using subscripted variables.

In our task we should have noticed that the age of the father depends on their son's age. This means that we need to know first the son's age before we can know the age of the father. Also we can write the age of man and his son at the present time:

Age of father is 42 years old.

Age of son is 12 years old.

Let us assume the variable  $x$  is the amount of years. This follows that the father's age is equal to  $(42 + x)$ . The son's age is equal to  $(12 + x)$ . We can write the ratio of ages in  $x$  years. According to our task we know that the age of the son be half the age of the man. So, this will give us the following equation:

$$\frac{(12 + x)}{(42 + x)} = \frac{1}{2}$$

Apply the rule of cross-multiplication of fractions.

$$2(12 + x) = (42 + x)$$

Then, solve this equation using our knowledge of solving linear equation in one variable.

$$24 + 2x = 42 + x$$

Combine like terms.

$$2x - x = 42 - 24$$

Simplify equation. This will give us the value of  $x$ .

$$x = 18$$

That is the son's age.

Hence, the father's age is equal to 60  $(42 + 18)$  years old, the son's age will be  $12 + 18 = 30$  years old, which is half the age of the father.

**Answer: 18 years**