



Problem of the Week

Problem C and Solutions

Show Me The Money

Problem

Over the past several years, Ima Saver collected nickels (5 cent coins) and dimes (10 cent coins) and put them in his pink piggy bank. Only nickels and dimes went in his bank. Finally, one day, the bank was full so Ima counted his money and discovered that he had exactly \$10 in the bank. He also observed that he had 11 more nickels than dimes in his bank. How many coins were in Ima Saver's pink piggy bank?

Solution 1

In this solution we will solve the problem without using equations.

Ima had 11 more nickels than dimes. These 11 nickels are worth $11 \times 5 = 55\text{¢}$ or \$0.55. The remaining $\$10.00 - \$0.55 = \$9.45$ would be made up using an equal number of nickels and dimes. Each nickel-dime combination is worth 15¢ or \$0.15. By dividing \$9.45 by \$0.15 we determine the number of 15 cent combinations that are required to make the total. Since $\$9.45 \div \$0.15 = 63$ we need 63 nickel-dime pairs. That is, we need 63 nickels and 63 dimes to make \$9.45. But there are 11 more nickels. Therefore, there is a total of $63 + 63 + 11 = 137$ coins in his bank.

Solution 2

In this solution we will solve the problem using an equation.

Let n represent the number of nickels and $(n - 11)$ represent the number of dimes. Since each nickel is worth 5¢ , the value of n nickels is $(5n)\text{¢}$. Since each dime is worth 10¢ , the value of $n - 11$ dimes is $10(n - 11)\text{¢}$. The bank contains a total value of \$10 or $1\,000\text{¢}$. Therefore,

$$\begin{aligned}\text{Value of Nickels (in } \text{¢}) + \text{Value of Dimes (in } \text{¢}) &= \text{Total Value (in } \text{¢}) \\ 5n + 10(n - 11) &= 1\,000 \\ 5n + 10n - 110 &= 1\,000 \\ 15n &= 1\,000 + 110 \\ 15n &= 1\,110 \\ n &= 74 \\ n - 11 &= 63\end{aligned}$$

There are 74 nickels and 63 dimes for a total of $74 + 63 = 137$ coins in his bank.

