

A two digit number has the property that the sum of its digits plus the product of its digits is equal to the number itself. What is the units digit of this number?

Suppose that the number is $10x + y$, where $1 \leq x \leq 9$ and $0 \leq y \leq 9$.

We have

$$xy + (x + y) = 10x + y$$

$$\Rightarrow xy + x = 10x$$

$$\Rightarrow xy = 9x$$

$$\Rightarrow y = 9 \quad (\text{dividing through by } x \text{ since } x \neq 0)$$