

Note Frame/Step-Solution Map

Concept

Solving basic logarithmic equations

Problem

$$\log_{10}x + \log_{10}(x + 3) = 1$$

Step 1

Write as a sum or difference and change it into a single log.

example

$$\log_{10}(x)(x + 3) = 1$$

Step 2

Change it into exponential form.

example

$$10 = (x)(x + 3)$$

Step 3

Solve for unknown using basic algebraic techniques.

example

$$\begin{aligned} 0 &= x^2 + 3x - 0 \\ 0 &= (x + 5)(x - 2) \\ x &= -5, x = 2 \end{aligned}$$

Step 4

Check roots in the original equation.

example

$$\begin{aligned} \log_{10}(-5)(-5 - 3) &= 1 \\ 1 &= 1 \\ \log_{10}(2)(2 - 3) &= 1 \end{aligned}$$

this is impossible because you can't have the log of a negative number