

Math Diversion Problem 414

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Easy to criticize, more difficult to be correct.
— Charlie Chan

The YouTube video is found at:

Source: https://www.youtube.com/watch?v=tKzQc_I1GLw
Title: Calculate logarithms in your head!
Presenter: The Map of Mathematics

1 The Problem

Given the relation

$$\log_{m+9} 9 = 2, \quad (1)$$

find the values of m .

2 The Solution

We should begin by raising $m + 9$ the power of equation (1), yielding¹

$$9 = (m + 9)^2, \quad (2)$$

or

$$m + 9 = 3, \quad (3)$$

where the negative root was discarded because a base has to be positive. This leaves us with

$$m = -6. \quad (4)$$

¹To raise a number b to the ‘power of an equation’ simply means this: If the equation is ‘LHS = RHS’, then $b^{\text{LHS=RHS}}$ means $b^{\text{LHS}} = b^{\text{RHS}}$.