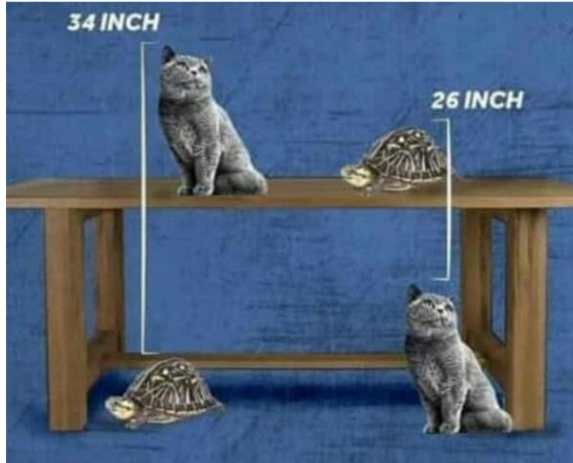


Table, Tabby, Tortoise Problem

17 May 2020

Jim Stevenson



This is a cute little problem I came across via James Tanton¹ on Twitter by Ayush DM:²

Here is an old Watsapp problem. How high is the table? Also find the height of the cat and tortoise.

My Solution

Using Figure 1 to translate the problem to symbolic algebra, where H , C , and T represent the heights of the table, cat, and tortoise respectively, we get the following two equations.

$$H - T + C = 34$$

$$H - C + T = 26$$

Adding the two equations yields

$$2H = 60 \Rightarrow H = 30 \text{ in}$$

So the table is 30 inches high.

If we subtract the two equations, we get

$$2(C - T) = 8 \Rightarrow C = T + 4$$

This means *any* height for the cat (less than the table height of 30 inches) is allowable, so long as the tortoise's height is 4 inches less. So there is not a unique solution for the heights of the cat and tortoise.

Alternate Solution

Ayush DM's Twitter site posted a more visual solution by Miguel HH³ as shown in Figure 2.

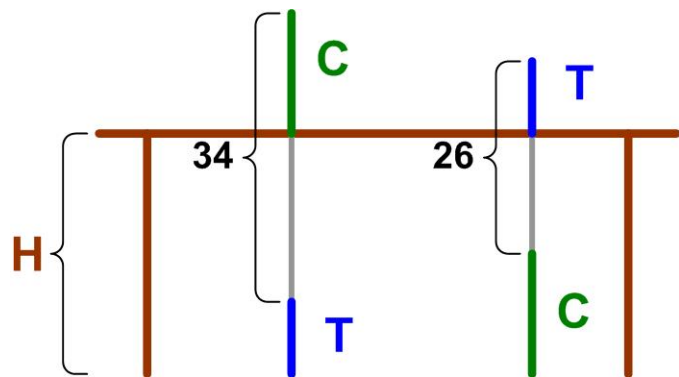


Figure 1 Problem Statement

¹ <https://twitter.com/jamestanton/status/1261139105611567106> [spoiler alert]

² <https://twitter.com/AYUSHDM1/status/1261085250928570369>

³ https://twitter.com/M1GU3L_HH/status/1261169101034196993/photo/1

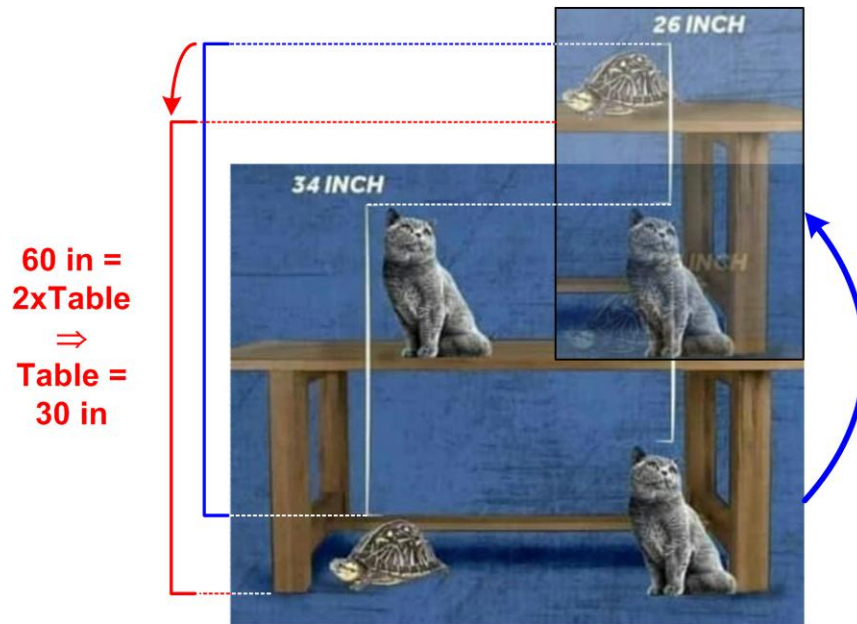


Figure 2 Alternative, Visual Solution by **M1GU3L** HHH

Clearly, this is a clever solution. The straight algebraic solution seems pedestrian by contrast. But that is just the point. Translating a problem into symbolic algebra and then (mindlessly?) solving it by the rules of algebra should be straight-forward and available to anyone who has studied algebra. There is no need for clever, ad hoc insights, however fun and surprising these may be. That means a powerful tool for solving problems is available to anyone, and not just geniuses. How great is that?

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