

# Math Diversion Problem 285

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The definition of a good mathematical problem  
is the mathematics it generates  
rather than the problem itself.  
— Andrew Wile

The YouTube video is found at:

Source: <https://www.youtube.com/watch?v=qXk9460YCow>

Title: Stanford University Admission Exam Tricks

Probably Never knew

Presenter: Super Academy

## 1 The Problem

Given the relations

$$x^2 + xy = 35, \quad (1a)$$

$$y^2 + xy = 14, \quad (1b)$$

find the values of  $xy$ .

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## 2 The Solution

I think that the quickest way to arrive at the solution is to find a quadric equation in the variable  $xy$ . So, let's begin by rearranging the Given equations:

$$x^2 = 35 - xy, \quad (2a)$$

$$y^2 = 14 - xy. \quad (2b)$$

Next, let's multiply these equations together, to get

$$(xy)^2 = (35 - xy)(14 - xy), \quad (3)$$

which will boil down to

$$xy = 10. \quad (4)$$