

Math Diversion 994

P. Reany

December 28, 2025

Learning is a treasure that will follow its owner everywhere.
— Chinese proverb

Source: <https://www.algebra.com/algebra>
Title: Question 154928: A Mixed-Rate Problem
Presenter: Patrick

1 Problem

I have 51 handle bars and 116 wheels. Using all the parts, how many tricycles and bicycles can I assemble?

2 Solution

Each bicycle and each tricycle will dibs certain necessary parts. For example, they'll all dibs one handle bar. They'll each dibs wheels as appropriate to their design requirements. Let's make a figure.

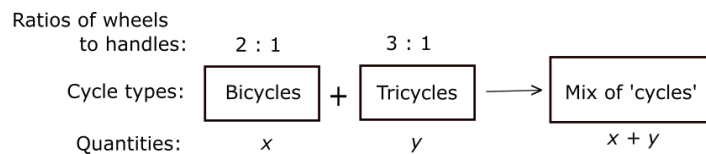


Figure 1. I didn't choose to represent the data as ratios to be novel or cute. They're simply an efficient way to represent the data.

Let's balance on handle bars first.

$$\frac{1 \text{ handle bar}}{\text{bicycle}} x + \frac{1 \text{ handle bar}}{\text{tricycle}} y = 51. \quad (1)$$

This simplifies to

$$x + y = 51, \quad (2a)$$

proving that the $x + y$ in Figure 1 is 51. Next, let's balance on wheels, only let's suppress the units this time.

$$2x + 3y = 116. \tag{2b}$$

If we can get positive integer solutions for (2a) and (2b), then we'll have 51 completed cycles. In fact, they do have positive integer solutions:

$$x = 37 \quad y = 14. \tag{3}$$