

Math Diversion 977

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Young men should prove theorems, old
men should write books.
— G. H. Hardy

Source: <https://www.algebra.com/algebra>
Title: Question 638401: A Mixed-Rate Problem
Presenter: Patrick

1 Problem

A textile company has specific dyeing and drying times for its different cloths. A roll of Cloth A requires 65 minutes of dyeing time and 50 minutes of drying time. A roll of Cloth B requires 55 minutes of dyeing time and 30 minutes of drying time. The production division allocates 2440 minutes of dyeing time and 1680 minutes of drying time for the week. How many rolls of each cloth can be dyed and dried?

2 Solution

Apparently in this textile facility, cloths are dyed consecutively and dried consecutively. Therefore their dyeing times and drying times add arithmetically in each category.

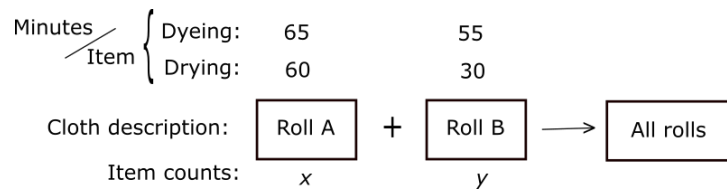


Figure 1. Tables are fine to organize raw data, but a well-thoughtout figure tells a better story of what's going on.

The total minutes allocated for dyeing is given as the sum of its parts:

$$65x + 55y = 2440. \quad (1a)$$

The total minutes allocated for drying is given as the sum of its parts, too:

$$50x + 30y = 1680. \quad (1b)$$

The solution to x and y from these last two equations yields

$$x = 24 \text{ rolls of Cloth A,} \quad y = 16 \text{ rolls of Cloth B.} \quad (2)$$