Math Diversion 969

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Good tools shorten labor.
— Charlie Chan

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Source: https://www.algebra.com/algebra
Title: Question 732982: A Mixed-Rate Problem
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1 Problem

Fred is analyzing the cost of producing two different items at an electronics company. an electrical sensing device uses 5 grams of copper and requires 3 hours to assemble. a smaller sensing device made by the same company uses 4 grams of copper but requires 5 hours to assemble. the first device has a production cost of $27. the second device has a production cost of $32. how much does it cost the company for a gram of this type of copper? what is the hourly labor cost at this company? (assuming that production cost is obtained by adding the copper cost and the labor cost)

2 Solution

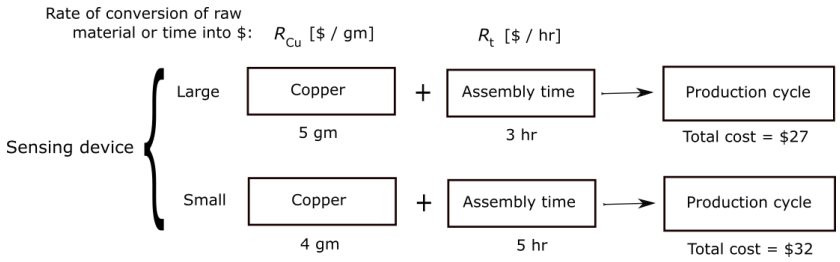

Figure 1. A somewhat different figure than similar problems of this type we've encountered before.

Now, we have one equation each for the total cost being the sum of the component costs for the large and small devices:

$$\text{Balance cost on large device:} \qquad R_{\text{Cu}}5 + R_t 3 = 27\,, \tag{1a}$$

$$\text{Balance cost on small device:} \qquad R_{\text{Cu}}4 + R_t 5 = 32\,. \tag{1b}$$

This pair of equations has solution $R_{\text{Cu}} = 3$ and $R_t = 4$. That's \$3 per gram of this expensive type of copper.

3 Conclusion

Once you've setup the figure properly, getting a system of equations to solve should be straightforword.