Problem of the Week
Problem A and Solution
Tapping to Success

Problem

For their dance unit, Yelena, Jackson, and Todd had to come up with a 30 second dance routine. All three of them are tap dancers, so they decided that each of them would do a 5 second solo tap, and the remaining 15 seconds would be a group tap.

During Yelena's solo tap section, she tapped at a rate of 5 taps per second.

During Jackson's solo tap section, he tapped at a rate of 4 taps per second.

During Todd's solo tap section, he tapped at a rate of 3 taps per second.

For their group tap section, they all tapped at the slowest rate so that they could all keep up.

How many taps did each dancer do in total during the full routine?

Solution

We use a table to keep track of how many taps each dancer did during their solo.

Dancer	Total Taps after 1 s	Total Taps after 2 s	Total Taps after 3 s	Total Taps after 4 s	Total Taps after 5 s
Yelena	5	10	15	20	25
Jackson	4	8	12	16	20
Todd	3	6	9	12	15

Since they all tapped at the slowest rate for the group tap, then they all tapped at 3 taps per second, which is the same as Todd's rate in the solo. From the table above, we know that in 5 seconds, Todd tapped 15 times. Then at this rate, in 10 seconds they would tap 30 times, and in 15 seconds they would tap 45 times.

Then we can conclude the following:

- Yelena tapped a total of $25 + 45 = 70$ times during the full routine.
- Jackson tapped a total of $20 + 45 = 65$ times during the full routine.
- Todd tapped a total of $15 + 45 = 60$ times during the full routine.