

Double Counting

- ✔

Quiz:

Puzzle: Sums of Rows and Columns

1 question
- ✔

Reading:

Double Counting

10 min
- ✔

Quiz:

'Homework Assignment' Problem

1 question
- ✔

Reading:

`Homework Assignment' Problem

10 min
- ✔

Quiz:

'Homework Assignment' Problem 2

1 question
- 📖

Practice Quiz:

Girls and Boys

1 question
- 📖

Quiz:

Chess Tournaments

1 question

Invariants

Termination

Even and Odd Numbers

`Homework Assignment' Problem

Problem. In a group of 20 students everyone has solved three problems from the homework assignment, and each problem was solved by two students. What is the number of problems in the assignment?

Imagine a summary sheet where the teacher marks which of the problems each student has solved.

	1	2	3	4	5	...	k
Alice	✓	✓			✓		
Bob		✓	✓	✓			
Charlie	✓		✓		✓		
⋮	⋮						

In this example, Alice solved problems 1, 2, and 5, whereas Bob solved problems 2, 3, and 4. The number of rows in this table is equal to 20 (the number of students). The number of columns is the (unknown) number of problems and is denoted by k .

What is the number of marks in the table? On one hand, it is equal to $20 \cdot 3 = 60$ as each student has solved three problems. On the other hand, it is equal to $2k$ as each problem has been solved by two students. From $60 = 2k$ we conclude that $k = 30$.

✔ Completed

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