



Problem of the Week

Problem B

These Teachers are Golden

Problem

Three teachers have classes practicing their gymnastics routines for their physical education open house.

- Ms. Korbut has four groups comprised of 2, 3, 4, and 5 students.
- Mrs. Miller has groups of 4, 5, 6, and 7.
- Mrs. Comaneci has groups of 6, 7, 8, and 9.

- a) If each teacher wants to have the same total number of students to supervise, then which single group should be moved to another teacher?
- b) What other arrangements of these groups would achieve this balance?



Solution

- a) Since Ms. Korbut has a total of 14 students, Mrs. Miller has 22 students, and Mrs. Comaneci has 30 students, there are $14 + 22 + 30 = 66$ students altogether. Thus each of the three teachers must have $66 \div 3 = 22$ students to supervise in order for them all to be equal.

So moving the group of 8 students from Mrs. Comaneci's class to Ms. Korbut's class will achieve the desired equal-sized classes.

- b) This balance can also be achieved by any rearrangement of the groups that gives a total of 22 students in each class. There are groups of $\{2\}$, $\{3\}$, $\{4\}$, $\{4\}$, $\{5\}$, $\{5\}$, $\{6\}$, $\{6\}$, $\{7\}$, $\{7\}$, $\{8\}$, and $\{9\}$.

One possibility would be classes of

$$3 + 6 + 6 + 7 = 22, 4 + 5 + 5 + 8 = 22, \text{ and } 2 + 4 + 7 + 9 = 22.$$

Another possibility is classes of

$$6 + 7 + 9 = 22, 3 + 4 + 7 + 8 = 22, \text{ and } 2 + 4 + 5 + 5 + 6 = 22.$$

Did you find other possibilities?

