**Lower Elementary:**

*Question:* Ten of the students in Mrs. Olson’s 1st grade class got all of the questions on their math quiz right. Five students got one answer wrong, and the final 5 students got two questions wrong. How many students are there in Mrs. Olson’s class?

**Upper Elementary:**

*Question:* Mrs. VanFossen is assigning economics project groups to her class of 39 4th graders. How can Mrs. VanFossen divide the class so that there are at least 10 groups with the same number of students in each group?



**Middle School:**

*Question:* Mr. Brown teaches 6th grade math and runs the chess club. 75% of the students in his chess club are also in his math class. The other 8 students in the chess club have a different math teacher. How many students are there in the chess club?

**Algebra and Up:**

*Question:* Mr. Wilson’s statistics class is hanging posters around the classroom that feature different graphs. There are twice as many dot plots as there are histograms. There are four more dot plots than pie chart posters. There are three more box-and-whisker plots than dot plots. Mr. Wilson also has a poster of a kitten in his classroom. Altogether, there are 28 posters. How many of each type of poster are there?

**Lower Elementary:**

*Question:* Ten of the students in Mrs. Olson’s 1st grade class got all of the questions on their math quiz right. Five students got one answer wrong, and the final 5 students got two questions wrong. How many students are there in Mrs. Olson’s class?

*Answer:* 20 students

*Solution:* There are 10 students with all correct answers, 5 students with one wrong answer, and 5 students with two wrong answers. That means that there are 10 +5 + 5 = 20 students in the class.

**Upper Elementary:**

*Question:* Mrs. VanFossen is assigning economics project groups to her class of 39 4th graders. How can Mrs. VanFossen divide the class so that there are at least 10 groups with the same number of students in each group?

*Answer:* 13 groups of 3 students

*Solution:* We need to test for divisibility. 39 can’t be divided into groups of 2 because it isn’t even. It can be divided into groups of 3 because the sum of its digits is 3 + 9 = 12 and 12 is divisible by 3. Next, we need to divide the class: 39 ÷ 3 = 13, so there must be 13 equal groups of 3. If we continue testing for divisibility, we’ll find that 1, 3, 13, and 39 are all of the factors of 39, so 3 groups of 13 and 13 groups of 3 are the only ways for the students to be assigned into equal groups.



**Middle School:**

*Question:* Mr. Brown teaches 6th grade math and runs the chess club. 75% of the students in his chess club are also in his math class. The other 8 students in the chess club have a different math teacher. How many students are there in the chess club?

*Answer:* 32 students

*Solution:* If 75% of the students are in Mr. Brown’s math class, that means that 25% are not. We know that 8 is 25%, or one quarter, of the total number of students, so the total must be 8 × 4 = 32 students.

**Algebra and Up:**

*Question:* Mr. Wilson’s statistics class is hanging posters around the classroom that feature different graphs. There are twice as many dot plots as there are histograms. There are four more dot plots than pie chart posters. There are three more box-and-whisker plots than dot plots. Mr. Wilson also has a poster of a kitten in his classroom. Altogether, there are 28 posters. How many of each type of poster are there?

*Answer:* 8 dot plots, 4 histograms, 4 pie charges, 11 box-and-whisker plots

*Solution:* Let’s define d as the number of dot plot posters. The number of histograms is 1/2d, the number of pie charts is d – 4, the number of box-and-whisker plots is d + 3, and the number of kittens is 1. We can turn all of that into an equation: d + (1/2d) + (d – 4) + (d + 3) + 1 = 31/2d = 28. From there, we can solve for d, which is 8. Once we know that, we can evaluate the rest of the poster counts.