Fall vs. Autumn – October 23, 2023

Problems & Solutions

As the weather is turning cooler and daylight is arriving later in the morning and trees are starting to lose their leaves, many of us are noticing that summer is over and we're well into fall. Or is it autumn? Mr. Kravis surveyed his class, and out of 28 students (with every student picking exactly one of the two options), the ratio of the number of students who called the season "fall" to the number of students who called the season "autumn" was 3:1. How many students called the season "fall?"

*The ratio tells us that for every three students who call the season "fall", there is one student who calls the season "autumn". We know this is true for every group of four students. In the class of 28 students, there are 28 ÷ 4 = 7 of these groups of four students. This means that there are 7 × 3 = **21** students who call the season "fall". An equation that we could have written and used is 3x + 1x = 28. Then we could solve for x and find the value of 3x.*

If we were now to create a pie chart showing the two groups of students determined during this survey, what would be the degree measure of the central angle of the sector of the circle representing the students who call the season "autumn?"

*Still using the information we gained from the initial ratio, we see that there were 7 students of 28 that call the season "autumn". This is 25% of the students. (We could also get this by knowing that one of every four students used "autumn".) If 25% of the pie chart is then devoted to this group of students, the sector of the pie chart would be 25% of 360 degrees, which is 0.25 × 360 = **90** degrees.*

Mr. Kravis then extended his survey to include the entire school. Every student responded with the term they use the most (fall or autumn). He found that in this larger survey of the entire school, the number of students who refer to the season as "fall" is five times the number of students who refer to the season as "autumn." What fraction of the total number of students in the school refers to the season as "autumn?" Express your answer as a common fraction.

*If we allow x to be the number of "autumn students", then 5x would represent the number of "fall students". This is a total of x + 5x = 6x students. Then x of the 6x students use the term "autumn" or x/6x = **1/6** of the students use the term "autumn".*

If there are 360 students in the school who answered Mr. Kravis' survey, how many of them use the term "fall?"

*As we saw with the solution to the previous problem, our total number of students is represented by 6x, which we now know to be equal to 360. If 6x = 360, then dividing both sides by 6 shows x = 60. The number of students using the term "fall" was represented by 5x, which we find is 5(60) = **300** students.*

Problems

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