MATHCOUNTS® Problem of the Week Archive

Making the Change – September 30, 2024

Problems & Solutions

As September is winding down, we can see that nine of the twelve calendar months of the year have passed. This is 9/12 = 3/4 = 75% of 2024, when considering just the months. If we instead want to know what percent of the *days* in 2024 have passed at the end of the last day of September, what would that percentage be? Express your answer to the nearest tenth.

*We should expect something pretty close to 75%, but since the months vary slightly in length, it shouldn't surprise us that the answer is not exactly 75%. Instead of counting the number of days that have passed, we know that October (31 days), November (30 days) and December (31 days) have not passed. This is a total of 92 of the 366 days, because remember, 2024 is a leap year! So, 366 – 92 = 274 of the 366 days have passed, and this is 274 ÷ 366 = **74.9**% of 2024, to the nearest tenth.*

At the end of the month, elementary school teachers around the country will be taking down the individual paper letters that spell out SEPTEMBER across the top of their bulletin boards and putting up a new set of letters for OCTOBER. What is the probability that if Jacob randomly picks up a letter from the pile of paper letters used to spell out SEPTEMBER, his letter can be used when putting up the word OCTOBER? Express your answer as a common fraction.

*Since September has nine letters, Jacob is choosing from a pile of nine pieces of paper. The R, B, T and three Es would all be good choices, since any one of them could be used when spelling out October. Therefore, there are six good choices out of nine, which is 6/9 = **2/3**.*

Ms. Carol's bulletin board is 5 feet wide. Each letter she will be using to spell out OCTOBER on her bulletin board is 5 inches wide and she wants to put OCTOBER across the top of the board and centered from left to right. If she will leave 1.5 inches of blank space between each of the letters, how many inches from the left side of the board should she place the left-most side of the first "O"?

*The board is 5 feet wide, which is a total of 5 × 12 = 60 inches. There are seven letters in the word October, and each one is five inches wide. This results in 7 × 5 = 35 inches of letters. Since there are seven letters, there are six blank spaces between letters, each of which is 1.5 inches, so this is 6 × 1.5 = 9 inches. With the letters and spaces, we now know that the word October will take up 35 + 9 = 44 inches of the width of the bulletin board, leaving 60 – 44 = 16 inches of space. Therefore, we should place the left-most side of the first "O" **8** inches from the left of the board (leaving 8 inches at the end of the word as well).*

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