MATHCOUNTS® Problem of the Week Archive

Holiday Shopping – November 30, 2020

Problems & Solutions

Marjorie went shopping on Black Friday and received successive discounts of 25%, 40% and 20% off of the original price. If Marjorie wanted to purchase the same items this week, what single percent discount would she have to receive off of the original prices to get the items for the same price that they were on Black Friday after the three successive discounts?

*When Marjorie gets a 25% discount off of a price, she pays 75% of the price. Following that logic for a 40% discount and a 20% discount, she would pay 60% and 80%, respectively. Thus, Marjorie paid 0.75(0.6)(0.8) = 0.36 = 36% of the original price and would have paid the same amount had she gotten one discount of 100% – 36% = **64**%.*

Deal City is having a sale on a video game that, because of its popularity, is notoriously hard to get a hold of. While waiting in line for Deal City to open (and the sale to begin), James notices that his friend Carlos is ahead of him and that there are only 5 people ahead of Carlos. If there is a total of 38 people in line, and 15 of those people are behind James, how many people are between James and Carlos?

*Since James and Carlos are two of the people in line, there are 38 – 2 = 36 people in line with James and Carlos. That means the number of people ahead of Carlos, the number of people between Carlos and James, and the number of people behind James is 36 people. Thus, letting x equal the number of people between Carlos and James, we can say 5 + x + 15 = 36 → x = **16** people.*

Celia managed to get all of her holiday shopping done on Black Friday. After totaling her receipts, she realized that she came in under budget. As a reward to herself, she decided to see if she could find any good deals during Cyber Monday so that she could buy herself something. After a 35% discount, followed by the addition of a 5% sales tax, Celia paid $477.75 for a large flat screen TV. What was the original price of the TV before Celia's discount and the sales tax?

*Since Celia received a 35% discount, she paid 65% of the price (0.65x). When a 5% tax was added, she paid 105% of the reduced price. Therefore, she paid 1.05(0.65x) = $477.75. Solving for x gives an original price of $**700**.*

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