MATHCOUNTS® Problem of the Week Archive

Back to School Shopping – August 14, 2017

Problems & Solutions

Bethany is going back to school shopping. She needs to buy notebooks and notices that two stores are running back to school sales. Store A sells notebooks for 48 cents each and is having a 25% off sale. Store B sells notebooks for 40 cents each and is having a 20% off sale. If she wants to get the best deal, which store should she go to, and how much cheaper are the notebooks at this store?

Store A's notebooks will be 0.75 × 48 = 36 cents. Store B's notebooks will be 0.80 × 40 = 32 cents. Bethany should go to ***Store B*** *and will save 36 – 32 =* ***4*** *cents.*

At the store, Bethany notices that the notebooks come in 4 colors: Red, Blue, Black and Green. She needs 6 notebooks for her classes this year. She wants to get at least one of each color. How many different color combinations are there for Bethany's 6 notebooks?

If Bethany wants at least one of each color, then we know she must choose at least one red, one blue, one black and one green. The question then becomes how many ways can she choose the colors for her last two notebooks. She has ***10*** *possible combinations for her last two notebooks: Red + Red, Red + Green, Red + Blue, Red + Black, Green + Green, Green + Blue, Green + Black, Blue + Blue, Blue + Black and Black + Black.*

Bethany puts a few other items in her cart and heads to the checkout of the store. The total for her purchase is $2.68. What is the fewest number of coins she can use to complete her purchase using quarters, dimes, nickels and pennies only?

Let's start at the highest denomination and work our way down. If the cost is $2.68, Bethany can pay $2.50 of the cost using 10 quarters. Of the remaining 18 cents, she can use 1 dime, 1 nickel and 3 pennies. In total, the least number of coins she could pay with is 10 + 1 + 1 + 3 = 15 coins.

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