Chances Part 3: Winning the Sweet Million & Other Lottery Games

1. Winning the Color Pick Game
   When choosing 3 colors out of 5 total possible color choices, the total number of combinations is...

   Explain where $5 \times 4 \times 3$ comes from.
   5 colors then 4 colors
   then 3 colors

   Explain why it ends at 3 and does not keep going.
   You only need 3 colors to win the color game

   $\frac{5 \times 4 \times 3}{3 \times 2 \times 1} = \frac{60}{6} = 10$

   The numerator: 60 is the total number of permutations

   10 is the total number of combinations

   Explain where $3 \times 2 \times 1$ comes from.
   their one set of winning colors

   The denominator:
   6 is the number of ways each combination can be arranged.

   Why is 60 being divided by 6?
   When you divide 60 by 6 you get 10 which is all the combinations

   There is only 1 winning combination of colors, so the probability of winning is

   What does the 1 represent?
   only one group wins

   Why is the 10 in the denominator and the 1 in the numerator?
   cause only one group of color wins and 10 is the total combination of colors.