YOU & MATHS   A drawer contains 64 socks. Each sock is one of 8 colors, and there are 8 socks of each color. If the socks in the drawer are thoroughly mixed and you randomly choose two of the socks, then what is the probability that these two socks will have the same color?

A $\dfrac{1}{7}$ **B** $\dfrac{1}{8}$ **C** $\dfrac{1}{9}$ **D** $\dfrac{7}{64}$ **E** $\dfrac{9}{64}$

(USA *University of South Carolina: High School Math Contest*, 2001)

The probability of choosing at random two socks that have the same color is equivalent to the probability of picking a second sock that has the same color as the first sock. Since after getting the first sock there are only 63 socks left in the drawer and only 7 of them are of the same color as the first sock, then:

$$p(\text{picking a 2}^{\text{nd}} \text{ sock with same color as 1}^{\text{st}}) = \frac{\text{number of socks of the same color as 1}^{\text{st}} \text{ one left}}{\text{total number of socks left}} = \frac{7}{63} = \frac{1}{9}.$$

The right answer is C.