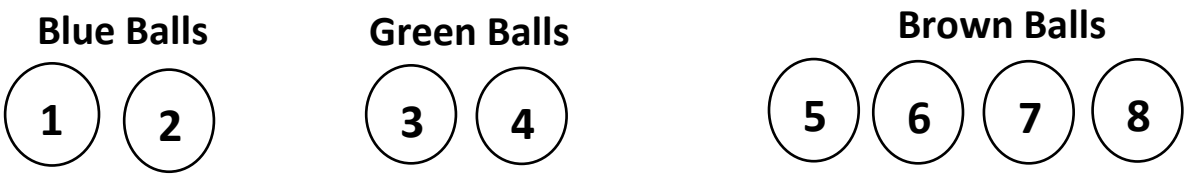
There are 8 balls in a bag 2 blue balls, 2 green balls and 4 brown balls. If 2 balls are randomly picked, what is the probability that the balls have the same colors?



First assign a number to every ball

(Blue balls numbers 1 and 2) (Green balls 3 and 4) (Brown balls 5 6 7 and 8)

Now list all the possible outcomes

(1,2) (1,3) (1,4) (1,5) (1,6) (1,7) (1,8)
(2,1) (2,3) (2,4) (2,5) (2,6) (2,7) (2,8)
(3,1) (3,2) (3,4) (3,5) (3,6) (3,7) (3,8)
(4,1) (4,2) (4,3) (4,5) (4,6) (4,7) (4,8)
(5,1) (5,2) (5,3) (5,4) (5,6) (5,7) (5,8)
(6,1) (6,2) (6,3) (6,4) (6,5) (6,7) (6,8)
(7,1) (7,2) (7,3) (7,4) (7,5) (7,6) (7,8)
(8,1) (8,2) (8,3) (8,4) (8,5) (8,6) (8,7)

The total possible outcomes are 56

Question

What is probability that the randomly picked two balls have the same colors?

Solution

From the total outcomes, find the two numbers that are in the same category because the numbers in the same categories share the same colors. So, the probability that the two balls have the same colors is **16/56 = 2/7**