

What are the chances?

1. Two draws are made from the following box containing red and white tickets.

[R , R , R , R , R , W , W]

a) If the draws are made without replacement, find the probability that both tickets drawn are red.

$$\frac{5}{7} \cdot \frac{4}{6} = \frac{10}{21}$$

b) If the draws are made without replacement, find the probability that at least one red ticket is drawn.

$$1 - \frac{2}{7} \cdot \frac{1}{6} = \frac{20}{21}$$

2. One ticket will be drawn from each of the two boxes shown below.

Box A : [5 , 6 , 7 , 8] Box B : [6 , 7 , 8 , 9]

Find the probability that the sum of the two numbers is greater than or equal to 14.

List the ways :

(5,6) (5,7) (5,8) (5,9)

(6,6) (6,7) (6,8) (6,9)

(7,6) (7,7) (7,8) (7,9)

(8,6) (8,7) (8,8) (8,9)

$$\frac{10}{16} = \frac{5}{8}$$

3. A department store runs a promotion where every customer independently draws a *scratch and win* ticket. Suppose that 60% of the tickets are *winners* and you visit the store twice during the promotion.

a) What is the chance that you get a *winner* on both visits?

$$.6 \times .6 = .36$$

b) What is the chance that you get a *winner* on your first visit or a *winner* on your second visit?

$$\text{General Additon Rule : } .6 + .6 - (.6) \times (.6) = .84$$

4. A standard deck of cards is shuffled. You are dealt one card.

a) Find the probability that you get an *ace* or a *king*.

$$\frac{4}{52} + \frac{4}{52} = \frac{2}{13}$$

b) Find the probability that you get an *ace* or a *heart*.

$$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$$