5. In a game, a player has to roll a dice and toss a coin. In order to win, the player has to get a 6 and a head. If the player gets a 6 and a tail, he is allowed another.

a.) what is the probability of winning?

b.) what is the probability of winning or getting another turn?

a.) The two events are independent, as the tossing of the coin has no effect on the rolling of the dice.

P[6] = $\frac{1}{6}$ P[Head] = $\frac{1}{2}$

P[A∩B] = P[6∩Head] = P[6] x P[Head]

$= \frac{1}{6} \times \frac{1}{2}$

$= \frac{1}{12}$

= 0.08333

= 8.33% chance of winning.

b.) The events are still independent; however, we now have two options. One option where we win with a 6 and a head, and one where we get another turn with a 6 and a tails.

P[6∩H] or P[6∩T] = (P[6] X P[H]) + (P[6] X P[T])

$= (\frac{1}{6} \times \frac{1}{2}) + (\frac{1}{6} \times \frac{1}{2})$

$= (\frac{1}{12}) + (\frac{1}{12})$

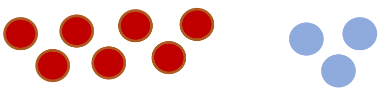
$= \frac{2}{12}$

$= \frac{1}{6}$

= 0.1667

= 16.67% chance of winning or getting another turn.

5.) If 3 blue balls and 7 red balls are placed in a bag, and two balls are randomly chosen without replacement, determine the probability of choosing:



a.) a blue ball and then a red ball.

b.) a red ball and then a blue ball.

c.) a red ball and blue ball in any order.

d.) 2 blue balls.

a.) Event A occurs before event B, and thus our events are dependent. The probability of choosing a red ball is dependent on the given fact that our blue ball was chosen first.

P[A∩B] = P[A] X P[A I B]

$= \frac{3}{10} \times \frac{7}{9}$