

1. A bag contains 36 red blocks, 48 green blocks, 22 yellow blocks, and 19 purple blocks. You pick one block from the bag at random. Find each theoretical probability.

$$\begin{array}{c} \text{P(green)} \\ \hline \frac{48}{125} \end{array}$$

$$\begin{array}{c} \text{P(purple)} \\ \hline \frac{19}{125} \end{array}$$

$$\begin{array}{c} \text{P(not yellow)} \\ \hline \frac{103}{125} \end{array}$$

$$\begin{array}{c} \text{P(green or yellow)} \\ \hline \frac{70}{125} = \frac{14}{25} \end{array}$$

$$\begin{array}{c} \text{P(yellow or not green)} \\ \hline \frac{77}{125} \end{array}$$

$$\begin{array}{c} \text{P(purple or not red)} \\ \hline \frac{89}{125} \end{array}$$

2. Suppose you roll two standard number die, one blue and one yellow. *36 possibilities*

What is the theoretical probability of getting a sum of 7?

1,6    3,4  
6,1    4,3  
2,5  
5,2

$$\frac{6}{36} = \frac{1}{6}$$

What is the probability of getting a sum greater than 10?

5,6  
6,6  
6,5

$$\frac{3}{36} = \frac{1}{12}$$

What is the probability that the numbers are 3 and 4?

3,4  
4,3

$$\frac{2}{36} = \frac{1}{18}$$

What is the probability that the blue die has a 1 and the yellow die has a 2?

$$\frac{1}{36}$$

3. A card is drawn at random from a 52 card deck. Determine the number of outcomes in the sample space. Then compute each theoretical probability.

How many outcomes are in the sample space? 52

P(face card)

$$\frac{16}{52} = \boxed{\frac{4}{13}}$$

P(Ace)

$$\frac{4}{52} = \boxed{\frac{1}{13}}$$

P(The card is red)

$$\boxed{\frac{1}{2}}$$

P(5 of hearts)

$$\boxed{\frac{1}{52}}$$

P(The card is between 3 and 7, inclusive)

$$\frac{20}{52} = \boxed{\frac{5}{13}}$$

P(The card is 2 or 3)

$$\frac{8}{52} = \boxed{\frac{2}{13}}$$

4. A penny, nickel, and dime are flipped at the same time. List out the possible outcomes. Then calculate each theoretical probability.

P	N	D
H	H	H
H	H	T
H	T	H
H	T	T
T	T	T
T	T	H
T	H	H
T	H	T

P(Exactly two tails)

$$\frac{3}{8}$$

P(At least two tails)

$$\frac{1}{2}$$

P(HHT)

$$\frac{1}{8}$$

P(Penny and Nickel are Tails)

$$\frac{1}{4}$$

P(Penny or Nickel are Tails)

$$\frac{6}{8} = \frac{3}{4}$$

P(No Tails)

$$\frac{1}{8}$$