

Probability: Events Involving "Not" and "Or"

1. Consider the experiment of rolling one fair die. Find the probability of each event.

- (a) Not prime $\frac{1}{2}$
- (b) Even or prime $\frac{5}{6}$
- (c) Less than 4 $\frac{1}{2}$
- (d) Not less than 2 $\frac{5}{6}$
- (e) Odd or less than 2 $\frac{1}{2}$
- (f) Odd or prime $\frac{2}{3}$
- (g) Odd or even 1

2. Suppose you have a jar with 20 marbles. 5 of them are green, 6 of them blue, 2 red, 2 yellow, 1 white, and 4 black. You will randomly select a single ball from the jar, and x represents the color of the marble you have chosen.

(a) Construct the probability distribution for the random variable x .

x	$p(x)$
G	$\frac{1}{4}$
Blu.	$\frac{3}{10}$
R	$\frac{1}{10}$
Y	$\frac{1}{10}$
W	$\frac{1}{20}$
Bla.	$\frac{1}{5}$

(b) Find the probability that you get a blue or white. $\frac{7}{20}$

3. Consider the experiment of drawing a single card from a standard 52-card deck. Determine the probability of each of the following events, along with the odds in favor of each event.

- (a) A king or queen $\frac{2}{12}$ and 2 : 11
- (b) Not a queen $\frac{12}{13}$ and 12 : 1
- (c) a club or spade $\frac{1}{2}$ and 1 : 1
- (d) Not a spade, or a king $\frac{10}{13}$ and 10 : 3
- (e) Neither a spade, nor a king $\frac{9}{13}$ and 9 : 5

4. A bag contains 100 blue marbles and 100 red marbles. Two marbles at a time are randomly selected. If both marbles are blue they are placed in box A. If both are red they are placed in box B. If one is blue and the other is red, they are placed in box C. After all the marbles are drawn, what's the probability that the number of marbles in box A is the same as the number of marbles in box B? 1