

## Hybleland L9-Lesson 24 Probability II-Assignment

### Complementary and Independent Events

#### Practice 1.

If we flip 6 coins, what is the probability of getting at least 2 heads?

#### Practice 2.

The letters of the word 'SIXTEEN' are randomly arranged. What is the probability that the two E's are not next to each other?

#### Practice 3.

A bin has 8 black balls and 7 white balls. 3 of the balls are drawn at random. What is the probability of drawing 2 of one color and the 1 of the other color?

#### Practice 4.

Two 6-sided dice, one red and one green, are rolled. What is the probability that the red die shows an odd number and the green die shows a number that is a perfect square?

Practice 5.

During a military exercise, the offensive decided to bombard the target twice. The probability of hitting the first shot is 0.6, and the probability of hitting the second shot is 0.8.

- 1> What is the probability that both shots hit the target?
- 2> What is the probability that there is only one shot hits the target?
- 3> What is the probability that both shots miss the target?

Practice 6.

In a math test, the probability that Joseph, Owen and Bryce gets an A is 0.5, 0.4, 0.2, respectively. What is the most likely number of people get an A after the test?




Practice 7.

We flip a fair coin 10 times. What is the probability that:

- (1) We get heads in exactly 8 of the 10 flips?
- (2) We get heads in at least 8 of the 10 flips?
- (3) We get heads in at least 6 of the 10 flips?

Practice 8.

We roll a fair 6-sided die 5 times. What is the probability that:

- (1) We get an odd number in exactly 4 of the 5 rolls?
- (2) We get a  or a  in exactly 3 of the 5 rolls?
- (3) We get a  in at most 2 of the rolls?

Practice 9.

The probability of getting rain on any given day in June in Capital City is  $\frac{1}{10}$ . What is the probability that it rains on at most 2 days in June?

Practice 10.

Two cards are dealt at random from a standard deck of 52 cards. What is the probability that

- (1) The first card is a ♥ and the second card is a ♣?
- (2) The first card is a 6 and the second card is a Queen?
- (3) The first card is a King and the second card is a ♥?
- (4) The first card is a ♦ and the second card is an Ace?

Practice 11.

Bag A has 3 white marbles and 4 black marbles. Bag B has 6 yellow marbles and 4 blue marbles. Bag C has 2 yellow marbles and 5 blue marbles. A marble is drawn at random from Bag A. If it is white, a marble is drawn at random from Bag B, otherwise, if it is black, marble is drawn at random from Bag C. What is the probability that the second marble drawn is yellow?

Practice 12. (*Just write down the expression and you don't need to calculate*)

Richard and Vanessa are going to play a game of foosball. The first player to score 5 goals wins. Vanessa is better: at any given point she is 60% likely to score the next goal. What is the probability that Richard wins?

Practice 13.

Wayne and Mario play a game in which they take turns flipping a fair coin. The first one to flip tails wins. Wayne goes first. What is the probability that Wayne wins?

Practice 14.

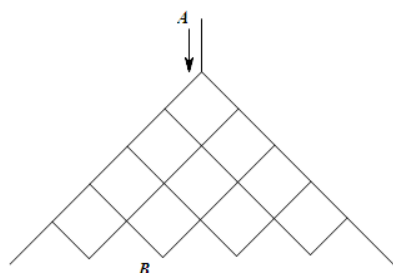
In the card game bridge, each of 4 players is dealt a hand of 13 of the 52 cards. What is the probability that each player receives exactly one Ace?

Practice 15.

Joseph likes fried rice or noodles for lunch. If he eats fried rice today, then the probability of eating fried rice tomorrow is  $\frac{1}{3}$ . If he eats noodles today, then the probability of eating fried rice tomorrow is  $\frac{1}{2}$ . On Monday, Joseph was eating fried rice at noon. What is the probability of eating fried rice at noon on Thursday?

Practice 16.

As shown in the figure, the grid lines represent the passages that allow the ball to slide down. Each small ball may slide to left or right at the intersection. The probability of sliding to left is  $\frac{1}{4}$ , and the probability of sliding to right is  $\frac{3}{4}$ . If you put a small ball from point A and let it fall, what is the probability that the ball will eventually reach point B?



Practice 17.

AMC10B 2011 / Problem 13

Two real numbers are selected independently at random from the interval  $[-20, 10]$ . What is the probability that the product of those numbers is greater than zero?

- A.  $\frac{1}{9}$  B.  $\frac{1}{3}$  C.  $\frac{4}{9}$  D.  $\frac{5}{9}$  E.  $\frac{2}{3}$

Practice 18.

AMC10A 2004 / Problem 10

Coin  $A$  is flipped three times and coin  $B$  is flipped four times. What is the probability that the number of heads obtained from flipping the two fair coins is the same?

- A.  $\frac{19}{128}$  B.  $\frac{23}{128}$  C.  $\frac{1}{4}$  D.  $\frac{35}{128}$  E.  $\frac{1}{2}$

Practice 19.

AMC10B 2008 / Problem 17

A poll shows that 70% of all voters approve of the mayor's work. On three separate occasions a pollster selects a voter at random. What is the probability that on exactly one of these three occasions the voter approves of the mayor's work?

- A. 0.063 B. 0.189 C. 0.233 D. 0.333 E. 0.441

Practice 20.

AMC10B 2014 / Problem 16

Four fair six-sided dice are rolled. What is the probability that at least three of the four dice show the same value?

- A.  $\frac{1}{36}$  B.  $\frac{7}{72}$  C.  $\frac{1}{9}$  D.  $\frac{5}{36}$  E.  $\frac{1}{6}$

Practice 21.

AMC10A 2017 / Problem 18

Amelia has a coin that lands heads with probability  $\frac{1}{3}$ , and Blaine has a coin that lands on heads with probability  $\frac{2}{5}$ . Amelia and Blaine alternately toss their coins until someone gets a head; the first one to get a head wins. All coin tosses are independent. Amelia goes first. The probability that Amelia wins is  $\frac{p}{q}$ , where  $p$  and  $q$  are relatively prime positive integers. What is  $q - p$ ?

- A. 1 B. 2 C. 3 D. 4 E. 5