

-----  
Solve the problem.

1. Suppose we roll a regular six-sided die twice and note whether it lands as an even number (E) or an odd number (O) on each roll. The sample space for this random experiment is
  - A) {EE, EO, OO}.
  - B) {E, E, O, O}.
  - C) {E, O}.
  - D) {EE, EO, OE, OO}.
  - E) None of the above
  
2. If we roll a regular six-sided die twice, the probability that both rolls will land as even numbers is
  - A)  $\frac{3}{4}$ .
  - B)  $\frac{1}{4}$ .
  - C)  $\frac{1}{2}$ .
  - D)  $\frac{1}{3}$ .
  - E) None of the above
  
3. If we roll a regular six-sided die twice, the probability that at least one of the rolls will land as an even number is
  - A)  $\frac{1}{2}$ .
  - B)  $\frac{1}{3}$ .
  - C)  $\frac{1}{4}$ .
  - D)  $\frac{3}{4}$ .
  - E) None of the above
  
4. If we roll a regular six-sided die twice, the probability of both rolls landing with the same parity (i.e., with both as an even number or both rolls landing as an odd number) is
  - A)  $\frac{1}{2}$ .
  - B)  $\frac{3}{4}$ .
  - C)  $\frac{1}{4}$ .
  - D)  $\frac{1}{3}$ .
  - E) None of the above

5. A coin is tossed twice. The sample space for this random experiment is
- A) {HH, HT, TH, TT}.
  - B) {HH, HT, TT}.
  - C) {H, H, T, T}.
  - D) {H, T}.
  - E) None of the above
6. A fair coin is tossed 6 times and heads or tails is noted on each toss. How many different outcomes are there in the sample space?
- A) 36
  - B) 2
  - C) 64
  - D) 12
  - E) None of the above
7. An honest coin is tossed ten times. The probability of tossing one head and nine tails is
- A)  $\frac{1}{10}$ .
  - B)  $\frac{5}{512}$ .
  - C)  $\frac{1}{1024}$ .
  - D)  $\frac{1}{9}$ .
  - E) None of the above
8. An honest coin is tossed ten times. The probability that the number of heads is double the number of tails is
- A)  $\frac{2}{3}$ .
  - B) 0.
  - C)  $\frac{1}{2}$ .
  - D)  $\frac{1}{3}$ .
  - E) None of the above
9. Suppose that an honest coin is tossed ten times. What is the probability that it will come up heads at least once?
- A)  $\frac{1023}{1024}$
  - B)  $\frac{9}{10}$
  - C)  $\frac{10}{9}$
  - D)  $\frac{1}{2}$
  - E) None of the above

A pair of honest dice is rolled, and the number on each die is noted.

10. What is the probability of rolling a total of 2?

A)  $\frac{1}{18}$

B)  $\frac{1}{6}$

C)  $\frac{1}{3}$

D)  $\frac{1}{36}$

E) None of the above

11. What is the probability of rolling a total that is neither 7 nor 11?

A)  $\frac{7}{9}$

B)  $\frac{1}{2}$

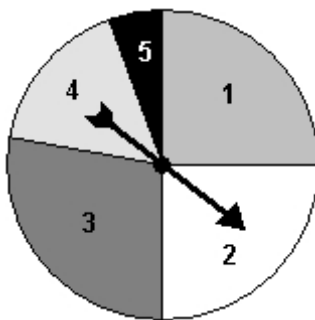
C)  $\frac{17}{18}$

D)  $\frac{5}{6}$

E) None of the above

Solve the problem.

12. In the spinner shown below, the regions numbered 1 and 2 correspond to  $90^\circ$  angles. The region numbered 3 corresponds to a  $100^\circ$  angle and the region numbered 4 corresponds to a  $60^\circ$  angle. Find the probability that, when spun randomly, the spinner will land on the region numbered 5.



A)  $\frac{1}{9}$

B)  $\frac{1}{18}$

C)  $\frac{1}{16}$

D)  $\frac{1}{17}$

E) None of the above

Four drivers called A, B, C, and D are entered in a race. According to the odds makers, the probability that the driver A will win the race is  $\Pr(A) = 0.4$ , and the other three drivers all have an equal probability of winning the race.

13. What is the probability that the driver B will not win the race?

- A) 0.4
- B) 0.8
- C) 0.6
- D) cannot be determined from the information given
- E) None of the above

Solve the problem.

14. If the chances of rain tomorrow are 20%, then the odds of rain tomorrow can be given as

- A) 2 to 1.
- B) 2 to 8.
- C) 2 to 10.
- D) 2 to 12.
- E) None of the above

15. Suppose that the odds against winning the grand prize in the lottery are 80,000,000 to 1. What is the probability if winning the lottery?

- A)  $\frac{1}{80,000,000}$
- B)  $\frac{79,999,999}{80,000,000}$
- C)  $\frac{1}{79,999,999}$
- D)  $\frac{1}{80,000,001}$
- E) None of the above

16. In a general probability model, which of the following statements [A), B), C), or D)] is not true?

- A) The probability of the sample space is always equal to 1.
- B) All probabilities are between 0 and 1 (0 and 1 included).
- C) All outcomes are equally likely.
- D) The impossible event always has probability equal to 0.
- E) All of the above statements are true.

17. Suppose that the odds of winning the grand prize in a raffle are 1 to 7. What is the probability of winning the grand prize?

- A)  $\frac{1}{6}$
- B)  $\frac{6}{7}$
- C)  $\frac{1}{7}$
- D)  $\frac{1}{8}$
- E) None of the above

Four drivers called A, B, C, and D are entered in a race. According to the odds makers, the probability that the driver A will win the race is  $\Pr(A) = 0.4$ , and the other three drivers all have an equal probability of winning the race.

18. What are the odds that driver D will win the race?

- A) 1 to 4
- B) 1 to 6
- C) 4 to 6
- D) 1 to 3
- E) None of the above

Solve the problem.

19. Consider the sample space  $S = \{o_1, o_2, o_3, o_4\}$ . Suppose you are given  $\Pr(o_1) = 0.35$  and  $\Pr(o_2) = \frac{1}{4}$ . If  $o_3$  and  $o_4$

have the same probability, find  $\Pr(o_3)$ .

- A) 0.4
- B) 0.1
- C) 0.3
- D) 0.2
- E) None of the above

A pair of honest dice is rolled, and the number on each die is noted.

20. What is the probability of rolling a total of 7?

- A)  $\frac{1}{6}$
- B)  $\frac{1}{3}$
- C)  $\frac{7}{36}$
- D)  $\frac{1}{36}$
- E) None of the above

21. What is the probability of rolling a total of 11?

- A)  $\frac{1}{36}$
- B)  $\frac{1}{6}$
- C)  $\frac{1}{18}$
- D)  $\frac{1}{4}$
- E) None of the above

22. What is the probability of rolling a total of either 7 or 11?

A)  $\frac{1}{36}$

B)  $\frac{1}{18}$

C)  $\frac{1}{4}$

D)  $\frac{1}{6}$

E) None of the above

Solve the problem.

23. Suppose that an honest coin is tossed ten times. What is the probability that at least twice it comes up heads?

A)  $\frac{507}{512}$

B)  $\frac{1013}{1024}$

C)  $\frac{4}{5}$

D)  $\frac{1}{512}$

E) None of the above

24. A person shoots ten consecutive free throws and on each toss we observe either a success or a failure. How many different outcomes are there in the sample space?

A)  $10^2$

B) 20

C)  $2^{10}$

D) 10

E) None of the above

25. A person shoots ten consecutive free throws and the total number of successes is observed. How many different outcomes are there in the sample space?

A)  $2^{10}$

B)  $10^2$

C) 11

D) 5

E) None of the above

26. If a fair coin is tossed twice, the probability that both tosses will come up heads is

A)  $\frac{1}{3}$ .

B)  $\frac{1}{2}$ .

C)  $\frac{1}{4}$ .

D)  $\frac{3}{4}$ .

E) None of the above

27. If a fair coin is tossed twice, the probability that at least one of the tosses will come up heads is

A)  $\frac{1}{4}$ .

B)  $\frac{1}{2}$ .

C)  $\frac{1}{3}$ .

D)  $\frac{3}{4}$ .

E) None of the above

28. If a fair coin is tossed twice, the probability of both tosses coming up the same is

A)  $\frac{1}{2}$ .

B)  $\frac{1}{3}$ .

C)  $\frac{3}{4}$ .

D)  $\frac{1}{4}$ .

E) None of the above