

TEST A

CHAPTER 11, PROBABILITY

- _____ 1. Two fair dice are rolled. Find the probability that the sum turning up is 9, given that the first die turns up an even number.
- _____ 2. Two fair dice are rolled. Find the probability that:
_____ a. They show a sum of 10.
_____ b. The first die turns up an odd number.
_____ c. Are these two events independent? Explain?
- _____ 3. A certain prescription drug produces side effects in 3% of the patients. Three patients that have taken this drug are selected at random. Find the probability that:
_____ a. All three had side effects.
_____ b. None of the three had side effects.
- _____ 4. Rosie has to take a Math course and an English course, both of which are available at 9 a.m., 10 a.m., and 11 a.m. If Rosie picks a schedule at random, what is the probability that she will have Math at 9 a.m. and English at 11 a.m.?
- _____ 5. The probability that a cassette tape is defective is 0.03. If two tapes are selected at random, what is the probability that both are good?
- _____ 6. A card is selected at random from a standard deck of 52 cards. Find the odds in favor of the card being:
_____ a. A red face card (Jack, Queen, King).
_____ b. Not a red face card.
- _____ 7. The probability of an event occurring is $\frac{3}{5}$. Find the odds:
_____ a. In favor of the event occurring.
_____ b. Against the event occurring.

8. The odds in favor of an event occurring are 3 to 5. Find:
_____ a. The odds against the event occurring?
_____ b. The probability that the event will
not occur?
- _____ 9. A single fair die is rolled twice. If exactly one
six turns up, you receive \$5 and, if two sixes
turn up, you receive \$10; otherwise, you get
nothing. What is a fair price to pay for playing
this game?
- _____ 10. The probabilities of being an "instant winner" of
\$25 or \$50 in a certain lottery are $\frac{1}{500}$ and
 $\frac{1}{1000}$, respectively. What is the mathematical
expectation of being an "instant winner" of \$25
or \$50?
11. A single fair die is rolled. Find the probability
of obtaining:
_____ a. A number different from both 1 and 2.
_____ b. A number greater than or equal to 4.
- _____ 12. A box contains 2 red balls, marked R_1 , and R_2 ,
and 3 white balls, marked W_1 , W_2 , and W_3 .
a. Two balls are drawn in succession without
replacement. Find the number of elements in
the sample space for this experiment. (We are
interested in which balls are drawn and the
order in which they are drawn.)
b. Do Part (a) if the balls are drawn in
succession with replacement.
13. A box contains 7 balls numbered from 1 to 7. If
a ball is taken at random from the box, find the
probability that it is:
_____ a. An even-numbered ball.
_____ b. Ball number 3.
_____ c. Not ball number 3.

14. Two cards are drawn at random and without replacement from a standard deck of 52 cards. Find the probability that:
_____ a. Both cards are red.
_____ b. Neither card is a Jack, Queen, or King.
15. A card is drawn at random from a standard deck of 52 cards and is then replaced. A second card is then drawn. Find the probability that:
_____ a. Both cards are red.
_____ b. Neither card is a King or a Queen
- _____ 16. A fair coin is tossed 3 times. What is the probability of obtaining at least one head?
17. An urn contains 3 white, 3 black, and 2 red balls. Find the probability of obtaining in a single random draw:
_____ a. A white ball or a red ball.
_____ b. A ball that is not white.
- _____ 18. A student estimates that the probability of his passing Chemistry or English is 0.8, the probability of his passing Chemistry is 0.7, but his probability of passing both is 0.5. What should be his estimate of the probability of his passing English?
- _____ 19. Two cards are drawn in succession and without replacement from a standard deck of 52 cards. What is the probability that they are both red face cards (Jack, Queen, King)?
- _____ 20. Two fair dice are rolled. Find the probability that the sum turning up is 10, given that the first die turns up 6.

8. The odds in favor of an event occurring are 3 to 5. The probability that the event will not occur is
a. $\frac{3}{5}$ b. $\frac{3}{8}$ c. $\frac{5}{3}$ d. $\frac{2}{5}$
e. $\frac{5}{8}$
9. A single fair die is rolled twice. If exactly one 6 comes up, you receive \$5, and if two 6's come up, you receive \$10; otherwise, you get nothing. A fair price to pay for playing this game is
a. \$1.67 b. \$4 c. \$5 d. \$6
e. \$7.50
10. The probabilities of being an "instant winner" of \$25 or \$50 in a certain lottery are $\frac{1}{500}$ and $\frac{1}{1000}$, respectively. The mathematical expectation of being an "instant winner" of \$25 or \$50 is
a. \$1 b. \$3.50 c. 20 cents d. 10 cents
e. None of these
11. A single fair die is rolled. The probability of obtaining a number different from both 1 and 2 is
a. $\frac{1}{6}$ b. $\frac{1}{3}$ c. $\frac{2}{3}$ d. $\frac{5}{6}$
e. None of these
12. A single fair die is rolled. The probability of obtaining a number greater than or equal to 4 is
a. $\frac{1}{3}$ b. $\frac{1}{2}$ c. $\frac{2}{3}$ d. $\frac{5}{6}$
e. None of these
13. A box contains two red balls marked R_1 , and R_2 , and three white balls marked W_1 , W_2 and W_3 . Two balls are drawn in succession and without replacement. Suppose that we are interested in which balls and in what order they are drawn. The number of elements in the sample space for this experiment is
a. 5 b. 10 c. 15 d. 20
e. None of these
14. Two cards are drawn at random and without replacement from a standard deck of 52 cards. The probability that both cards are red is
a. $\frac{13}{51}$ b. $\frac{26}{51}$ c. $\frac{25}{102}$ d. $\frac{1}{4}$
e. None of these

15. If two cards are drawn at random and without replacement from a standard deck of 52 cards, the probability that neither card is a King, Queen or Jack is
- a. $10/17$ b. $10/13$ c. $1/40$ d. $\frac{C(12,2)}{C(52,2)}$
e. None of these
16. A fair coin is tossed 3 times. The probability of getting at least one head is
- a. $1/2$ b. $3/4$ c. $7/8$ d. $15/16$
e. None of these
17. An urn contains three white balls, three black balls, and two red balls. The probability of obtaining a white or a red ball in a single draw is
- a. $5/8$ b. $3/8$ c. $1/2$ d. 1
e. None of these
18. For the urn of Problem 17, the probability of obtaining a ball that is not white is
- a. $5/8$ b. $3/8$ c. $1/2$ d. 1
e. None of these
19. Tommy estimates that the probability of his passing Chemistry or English is 0.8, the probability of his passing Chemistry is 0.7, but his probability of passing both is 0.5. What should be his estimate of the probability of his passing English?
- a. 0.3 b. 0.4 c. 0.5 d. 0.6
e. 0.7
20. Two cards are drawn in succession and without replacement from a standard deck of 52 cards. The probability that they are both red face cards (Jack, Queen, King) is
- a. $\frac{3}{26}$ b. $\frac{6}{13}$ c. $\frac{12 \times 11}{52 \times 51}$ d. $(\frac{3}{13})^2$
e. None of these