Probability Basics Study Guide/Practice Test   **Name** _____

1.   Roll a die once. Find the probability that the die lands on a 3 or more.

        P (3 or more) = _____

2.   Draw a card out of a standard deck of playing cards. Find the probability of drawing an ace.

        P (Ace) = _____

3.   Toss 2 coins. Let H represent "heads" and T represent "tails".

        (a) List the outcomes in the sample space.   S = { _____ }

        (b) Find the probability of at least one head.

                P (at least one H) = _____

4.   (a) Flip a coin 10 times. What is the probability of all heads? Show your reasoning.

        (b) This probability experiment involves dependent trials. True or False. _____

5.   Pick a card out of a standard deck of 52 cards. Find the probability of drawing

        (a) An ace or a face card.

        (b) A face card or a black card.

        (c) Which of these situations (a or b) involves overlapping events? _____

6.   What is the probability of rolling two 5's in a row with a single die? Show your reasoning.

7.   Consider the following two containers.

MATH   HAT
#1   #2

       If a container above is selected at random, and then a letter is selected at random from the chosen container, what is the probability that the letter chosen is an A? _____

8.   A box contains five blue balls and four green balls. If three balls are drawn one by one, find the probability of the event that they are all blue if the drawing is done

       (a) with replacement   (b) without replacement
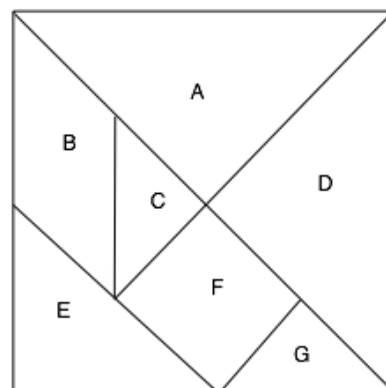
9.   How many batting orders are possible for a 9-player little league baseball team?

10.   If a dart is thrown and lands somewhere on the tangram dartboard below, what is the probability of the event of its landing on

       (a) region A

       (b) region B

       (c) region C

11. If 10 men and 10 women are in a jury pool, what is the probability that all 5 people who are selected for a jury are women?

12. Given the following bag of marbles, find the probability of picking

    (a) a green marble

    (b) two green marbles in a row (without replacement)

    5 Green, 3 Red, 4 Blue

    (c) three green marbles in a row (with replacement)

13. What is the probability that a student spins the following spinner and it lands on
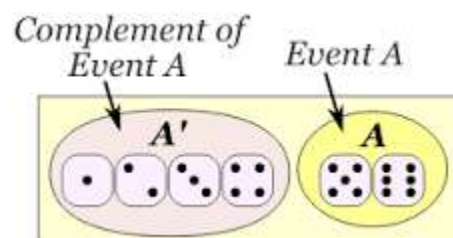
    (a) Yellow

    (b) Red

    (c) Create a simulation for this game.

14. Roll a single die once.

    (a) Find P(A).

    Complement of Event A   Event A

    (b) Find P(A').

    (c) Find P(A) + P(A').

15. A club consists of 12 members. In how many different ways can a group of 4 people be selected to go on a trip to Europe?

16. Given the following image involving rolling two dice, find the probability that the sum is

   (a) 7

   (b) 10

   (c) 10 or more

   (d) even

17. A fair coin was flipped three times and landed heads three times. What is the probability of a head on the very next toss?

18. What is the probability of a fair coin landing heads three times in a row?

19. A bag contains 5 red candies, 6 white candies, and 7 blue candies. Suppose one piece of candy is drawn at random. Find the probability that

   (a) a white candy is drawn

   (b) neither a white candy nor a blue candy is drawn

20.   In a NASA rocket firing, the probability of the success of the first stage is 95%, of the second stage 97%, and of the third stage 99%. What is the probability for success for the three-stage rocket firing? Round to the nearest percent.

21.   If automobile license plates consist of three letters (A-Z) followed by three digits (0-9), how many different possible license plates are possible if letters and digits may be repeated?

22.   A committee of five is selected at random from a group consisting of 23 Republicans. How many ways can this committee be chosen?

23.   If two dice are rolled 360 times, approximately how many times should you expect a sum of 10?

24.   Compute. Show correct use of the formulas.

        (a) $_6C_3$ _____   (b) $_7P_4$ _____

25.   In a class of 100 students, 65 take statistics, 24 take calculus, and 12 take both subjects. What is the probability that a randomly selected student takes neither statistics nor calculus? Hint: Use a Venn diagram.

26.   Maggie watched 100 cars drive by her window and compiled the following chart.

Make	Number	Make	Number
Honda	27	BMW	6
Toyota	19	Hyundai	6
Ford	12	GMC	5
Nissan	10	Mercedes-Benz	4
Dodge	7	Saturn	4

What is the empirical probability that the next car she sees is a Honda or a Toyota?

27.   In an election, 40% of eligible voters did not vote. If three eligible voters are selected at random, find the probability that

(a) None of them voted in the election

Round to
the nearest
percent.

(b) At least one of the three voted in the election

28.   In a board of directors composed of 10 people, in how many ways can one chief executive officer, one director, and one treasurer be selected?

29.   Friendly City College needs to raise money to buy a computer. They decide to conduct a raffle. A single cash prize of $1,000 is to be awarded. If they sell 3,000 tickets at $2 each, find the expected gain (loss) if you buy one ticket. There is only one winning ticket. Set up a probability distribution to receive full credit. Round to the nearest hundredth.

30.   (a) Create a simulation using the randInt command (in TI-84 Plus graphing calculators and in Microsoft Excel) for
         the following question: What is the probability of a couple with 5 children having all five girls?

        (b) Then run your experiment 20 times, and comment on how the empirical results compare to what you would
         expect theoretically.

31.   Tiger Woods has 40 : 1 odds against his winning the next PGA tournament. Find the probability that he will win
        this tournament, rounding to the nearest percent.

Do your best! Rise to the challenge! Live and learn!