Precalculus Review   Name_____

I.   State whether the variable is discrete or continuous.
1. The number of cups of coffee sold in a cafeteria during lunch.   _____
2. The height of a player on a basketball team.   _____
3. The temperature in degrees Fahrenheit on July 4th in Dallas   _____
4. The number of goals scored in a soccer game.   _____

II.   Determine whether the distribution represents a probability distribution. If not, identify the requirement that is not satisfied.

5. _____

x	$P(x)$
1	0.2
2	0.2
3	0.2
4	0.2
5	0.2

6. _____

x	$P(x)$
3	-0.3
6	0.5
9	0.1
12	0.3
15	0.4

III.   Determine the probability distribution's missing value.

7. The probability that a shopper will purchase 0,1,2,3, or 4 items.

x	0	1	2	3	4
$P(x)$	.15	.18	.24	.36	___

8. The probability that a tutor sees 0,1,2,3,or 4 student son a given day.

x	0	1	2	3	4
$P(x)$	____	.15	.20	.20	.25

IV.   The random variable x represents the number of tests that a patient entering a hospital will have along with the corresponding probabilities.

X	0	1	2	3	4
$P(x)$	3/17	5/17	6/17	2/17	1/17

9.   Find the mean. _____

V. 10. One thousand tickets are sold at $1 each. One ticket will be randomly selected and the winner will receive a color television valued at $350. What is the expected value if a person buys one ticket?

VI. The frequency distribution represents the number of cars per household in a town of 1000 households.

Cars	Households
0	125
1	428
2	256
3	108
4	83

11.   Construct a probability distribution for the random variable X.
12.   Graph the distribution.
13.   Find the mean.
14.   Find the probability of randomly selecting a household that has less than two cars.
15.   Find the probability of randomly selecting a household that has at least one car.

VII.   For 16-17, decide whether the experiment is a binomial experiment. If it is not, explain why.
16. You roll a die 100 times. The random variable represents the number that appears on each roll of the die.
17. Testing a pain reliever using 20 people to determine if it is effective. The random variable represents the number of people who find the pain reliever to be effective.
Find the following calculations:
18. In a recent survey, 80% of the community favored building a police substation in their neighborhood. If 15 citizens are chosen, find the probability that exactly 10 of them favor the building of the police substation.
19. A recent survey found that 70% of all adults over 50 wear glasses for driving. In a random sample of 10 adults over 50, what is the probability that at least six wear glasses?
20. What is the mean of this sample of 10 adults over 50 who wear glasses for driving?
21. The probability that a tennis set will go to a tiebreaker is 15%. In 20 randomly selected tennis sets, what is the mean of the number of tiebreakers?

Questions 22 - 25 refer to the table that lists the answers to the survey question "Would you prefer a Mercedes or a Lexus?"

	Male	Female	Total
Mercedes	37	25	62
Lexus	34	31	65
Total	71	56	127

22. What is the probability that a student prefers Mercedes given that he is male?

23. What is the probability that a student is female given that she prefers a Lexus?

24. If a student is chosen at random, find the probability of selecting someone who prefers Lexus and is male.

25. If a student is chosen at random, find the probability of selecting someone who prefers a Mercedes and is female.

26.   A card is drawn from a standard deck of 52 playing cards. Find the probability that the card is a queen and a red card.

27.   In how many ways can you arrange 8 cans sitting in a row? (Assume that all cans are used in the arrangements).

28.   Find the probability of getting 5 out of 5 multiple choice questions correct if random guesses are made and the questions have 4 answer choices.

29. If you are dealt two cards successively without replacement from a standard deck, find the probability that the first card is a seven and the second card is a jack.

30.   If you are dealt two cards successively without replacement from a standard deck, find the probability that the second card is an ace given that the first card was also an ace.

31. A card is drawn from a standard deck of 52 playing cards. Find the probability that the card is not a face card.

32. How many different codes are possible for a code of two letters followed by 3 digits if:

       a. the digits can be repeated and the letters cannot?

       b. Q must be the first letter and the number 3 must be the first number and all the other digits must be odd?

33. Consider a hat with pieces of paper inside. The papers are numbered as follows: 10 pieces with the number "1", 3 pieces with the number "7", and 2 pieces with the number "50." Find the expected value for drawing a ticket from this hat.

34. Someone is using a loaded die. The probability of rolling a "3" is ½ and the rest of the values have equal probabilities. Find the expected value for rolling this die.

35. A certain surgical procedure has an 85% chance of success. A doctor performs the procedure on eight patients. The random variable, x, represents the number of successful surgeries.
     Binomial?
- Fixed number of independent trials _____
- Only two possible outcomes (success or failure) _____
- The probability of success is the same for each trial_____
- The variable, x, counts the number of successful trials_____

36. The model of the car you are thinking of buying is available in nine different colors and three different styles (hatchback, sedan, or station wagon). In how many ways can you order the car?

37. A medical researcher needs 6 people to test the effectiveness of an experimental drug. If 13 people have volunteered for the test, in how many ways can 6 people be selected?

38. Fifty people purchase raffle tickets. Three winning tickets are selected at random. If first prize is $1000, second prize is $500, and third prize is $100, in how many different ways can the prizes be awarded?

39. How many different four-letter passwords can be formed from the letters A, B, C, D, E, F and G if no repetition of letters is allowed?

40. Fifty people purchase raffle tickets. Three winning tickets are selected at random. If each prize is $500, in how many different ways can the prizes be awarded?