Name:

SHOW YOUR WORK for questions 1 - 12. <u>Answers alone are not sufficient here.</u>

If you are using your calculator WRITE DOWN THE COMMAND USED.

1) The annual salary for police officers in San Diego is normally distributed with a population mean of $55,200 and a population standard deviation of $18,000. **A sample of 35 police officers** is randomly selected. What is the probability that their mean annual salary is *more than* $50,000? (round your answer to 4 decimal places)

2) A survey was conducted to measure the exercise habits of older adults. Exercise times for older adults are normally distributed with a mean of 30 minutes per day and a standard deviation of 2 minutes per day . **Find the probability that an older adult spends between 28 to 33 minutes a day exercising.** (round your answer to 4 decimal places)

3) Human body temperatures are normally distributed with a mean of 98.20 degrees (F) and a standard deviation of .62 degrees (F). Find the probability that a randomly selected individual will have a temperature greater than 99.1 degrees (F) ? (round your answer to 4 decimal places)

4) In a survey, students were asked how many hours per week they spend on studying for a math class. The random variable x represents the number of hours a student spends on studying for a math class. (Fill in the missing probability and answer the questions below)
    (Round your answers to the hundredths place)

X	0	1	2	3
P(x)	0.04	?	0.20	0.45

a)   Find the **mean** and the **standard deviation** of the following probability distribution.

b)   What is the probability that a student studies at least 1 hour per week?

c)   Is it unusual for a student to study zero hours per week for a math class? EXPLAIN. Do not just give a yes/no answer.

5) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a *queen* **or** *a heart*? Based on your answer **is it likely** that you will draw a card that is a heart or a queen? Explain. (round answer to the thousandths place)

6) Heights of men on a baseball team have a bell-shaped distribution with a mean of 172 cm and a standard deviation of 5 cm. Using the empirical rule, what is the approximate percentage of the men between 162 cm and 182 cm?

7) An airline estimates that 80% of people booked on their flights actually show up. If the airline books 64 people on a flight for which the maximum number is 62, what is the probability that the number of people who show up will exceed the capacity of the plane? (You may leave your answer in scientific notation)

(Round to 4 decimal places)

8) If 20% of the people in a community use the emergency room at a hospital, find these probabilities for a sample of 8 people;

a) What is the probability that <u>at most three</u> used the emergency room?

b) What is the probability that <u>exactly three</u> used the emergency room?

c) What is the probability that <u>at least five</u> used the emergency room?

9) If 20% of the people in a community use the emergency room at a hospital, for a sample of 8 people, find the following

    a. Find the **mean**

    b. Find the **standard deviation** (round to 4 decimal places)

    c. For such groups of 8, would it be **unusual** to get 4 people using the emergency room? Do not just answer yes/no. (Use $\mu - 2\sigma$ $\;and\; \mu + 2\sigma$ to explain)

10) The weights of newborn babies can be approximated by a normal distribution. The mean weight of a newborn is 7.1 lbs with a standard deviation of 1.28 lbs. Find the weight that would place a newborn in the **TOP** 30% of all weights. (Round your answer to the hundredths place)

(you may leave your answer in fraction form)

11) A certain lottery is won by selecting the correct five numbers from 1, 2, 3,…, 29. (Assume that there are no repeats)

    a. Find the probability of winning if the winning five numbers can be selected in any order. In other words, assume that the order in which the numbers are drawn is not important.

    b. Find the probability of winning if the winning five numbers must be selected in the **same order** that they are drawn?

12) A player must pay $1.00 to play a card game at a local casino. A player wins $5.00 if a SPADE card is selected, $10 if a QUEEN card is selected and $20 if the QUEEN OF SPADES is selected. (If any other card is selected the player wins nothing)

Using the information above, complete the table.

X	P(x)

a) Find the expected winnings **(expected value)**? Round to the nearest cent.

b) Does the game favor the player or the owner?

c) What must the player pay in order to break even (E = 0)

Fourteen different second-year medical students measured the blood pressure of the same person. The <u>sample data</u> below are the systolic readings in mmHg.

132, 140, 132, 132, 140, 143, 136, 137, 136, 143, 121, 150, 143, 130

(round all answers to the tenths place)

13) Find the standard deviation of the data set. _____

14) Find the median of the data set. _____

15) Find the mean of the data set. _____

16) Find the variance of the data set. _____

17) Find the mode of the data set. _____

Use the following frequency table to answer questions 18 -25 (round to the tenths place when appropriate)

	class	frequency
1	1 - 6	7
2	7 -12	10
3	13– 18	15
4	19 -24	10
5	25 - 30	5
6	31 -36	1

18)   Find all of the **class boundaries**

19) What is $\sum f$ (give the numerical answer) _____

20) What is the **class width**? _____
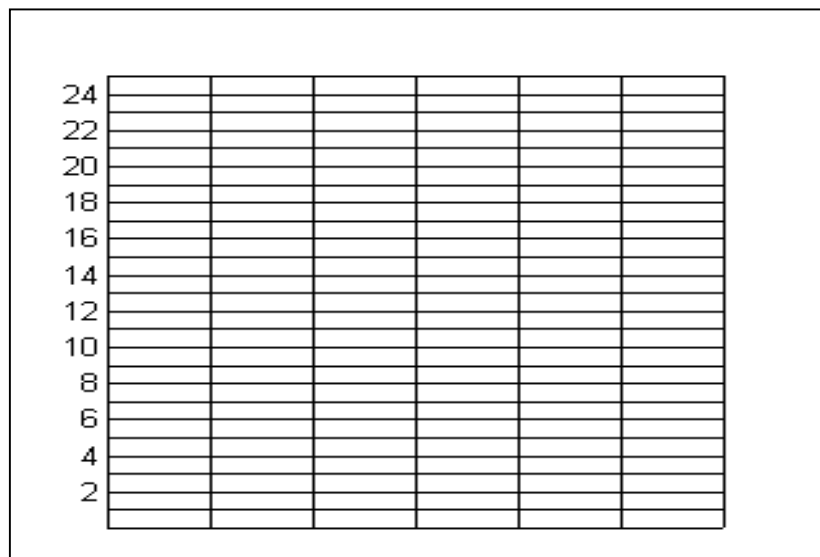
21) What is the **cumulative frequency** of the 3rd class? _____

22) What is the **relative frequency** of the FOURTH class? _____

23) Find the **mean** of the data represented by the table above. _____

24) Find the standard deviation. _____

25) Construct a **histogram** using the frequency for the vertical axis and CLASS BOUNDARIES or CLASS MIDPOINTS for the horizontal axis.

The table below shows the soft drinks preferences of people in three age groups. Find the totals before answering questions 26 - 28.

	Coke	Pepsi	Store Brand Cola	Total
Under 21	40	25	20	
Age 21 – 40	35	20	30	
Over 40	20	30	35	
Total				

If one of the 255 subjects is randomly selected, find the probability that

(keep your answers in fraction form)

26) The person drinks Pepsi **or** drinks Coke.

27) The person is over 40 years of age **or** they drink Pepsi.

28) The person drinks the Store Brand Cola **given** the person is under 21 years of age