

Name _____

1. (20 points)

Fill in the following table, then answer the questions by considering the **midpoint** of each class to **represent all the scores** in that class.

Midpoint	Class	f	Relative f	Cumulative $f (\le)$	Relative Cumulative $f (\le)$
	15.5 – 20.5	1			
	20.5 – 25.5	9			
	25.5 – 30.5	21			
	30.5 – 35.5	35			
	35.5 – 40.5	24			
	40.5 – 45.5	10			

The mean of the data is _____

The median of the data is _____

The third (upper) quartile is _____

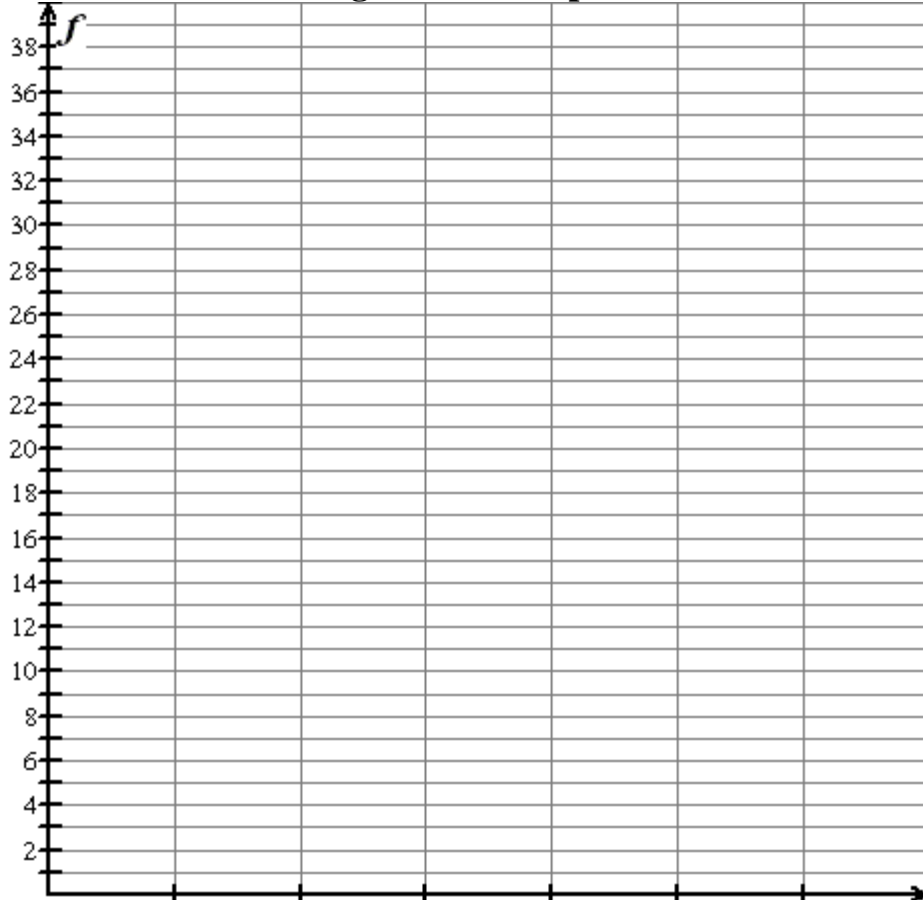
The 20'th percentile score is _____

The mode is _____

The sample standard deviation is _____

Below draw a histogram of the data plotting frequency as the vertical axis.

Histogram of Grouped Data



2. (28 points) A study was reported* in 1975 on the employment status of divorced, separated or married women. From the data (based on a survey of 54,458 women all of whom were either divorced/separated or married) it was determined that 57.8% of all divorced/separated women were employed outside of the home. Only 44.4% of all the married women were employed outside of the home. The fraction of women in the study who were divorced/separated was 12.7% .

*U.S. Bureau of Labor Statistics, *Special Labor Force Report*, No. 198.

If any one of the women in the study were picked at random what would be the probability

- A. That she would be married?

- B. That she would be married and employed outside the home?

- C. That she would be divorced/separated and not employed outside of the home?

- D. That she would be divorced/separated and employed outside of the home?

- E. That she would be employed outside of the home?

- F. That she would be employed outside of the home or divorced/separated?

- G. What is the probability that if a woman employed outside the home were picked at random that she would be divorced/separated?

3. (15 points)

- A. If two six-sided dice are tossed fairly what is the probability of a "doubles" (both top-most faces the same)?

- B. If the dice are tossed repeatedly until a double occurs, what is the probability that eight tosses are required?

- C. If the dice are tossed repeatedly until a double occurs, what is the expected number of tosses required?

4. (15 points)

A prepared surface has an average of 1 dislocation for every eight square nanometers.

- a) What is the probability that in a 16 square nanometer section of this surface that there are 0 dislocations?

- b) What is the probability that in a 16 square nanometer section of this surface that there are 1 dislocations?

- c) What is the probability that in a 16 square nanometer section of this surface that there are 2 dislocations?

- d) What is the probability that in a 16 square nanometer section of this surface that there are more than 3 dislocations?

5. (20 points).

It is estimated that 15% of all deer in a given region are infected with CWD. A sample of 20 deer in this region are harvested by the DNR. Assume that the estimate of 15% is true, and that the harvesting constituted a random sample.

- A. What is the expected number of CWD infected deer in the sample?

- B. Estimate the standard deviation of the number of CWD infected deer in the sample.

- C. What is the probability that not a single CWD infected deer was sampled?

- D. What is the probability that less than five (not including five) CWD infected deer were sampled?

- C. What is the probability that five or more CWD infected deer were sampled?

6. (22 points)

A lotto game is designed as follows:

For \$4.00 purchase any four numbers from 1 to 25. Four different numbers from 1 to 25 are picked at random without replacement. Depending on the number of matches prizes are awarded as follows :

2 matches	—	\$5.00
3 matches	—	\$10.00
4 matches	—	\$1000.00

Let x stand for the number of matches for one play of the game. Calculate the probability, $p(x)$, that x takes on a value between 0 and 4, then fill in the following probability distribution table. Calculate the mean and the standard deviation of the distribution.

x	$p(x)$
0	
1	
2	
3	
4	
μ_x	
σ_x	

Calculate the probability distribution for w , a player's **net** earnings. Fill in the following table and calculate the the mean and standard deviation of w .

w	$p(w)$

$\mu_w =$ _____

$\sigma_w =$ _____

If 50,000 people were to play this game, how much money would you expect the game's sponsors to make?