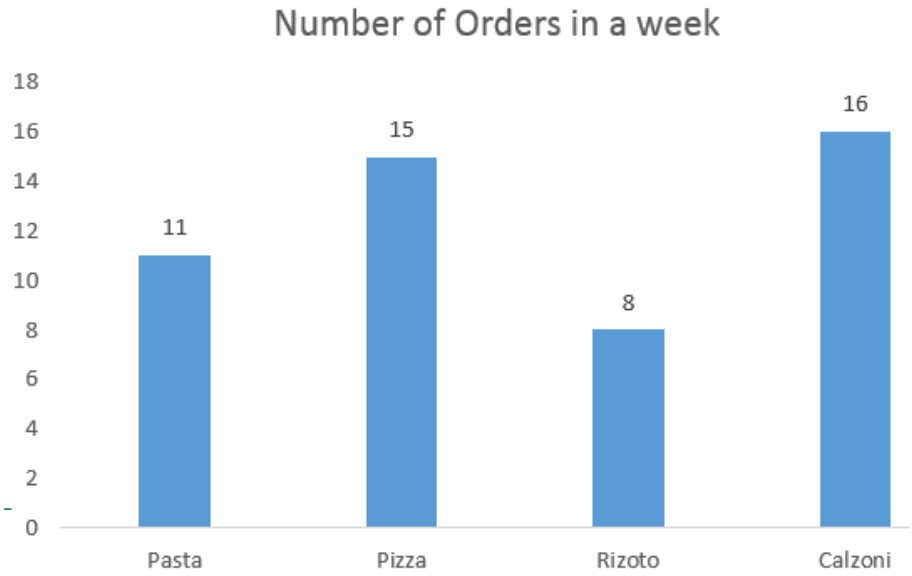
Question 1:

Consider the graph of the orders done by customers at an Italian restaurant over a given week.

a) What is the type of the variable under study (Graphed)?
   Qualitative
b) According to customers, what is the most favored order?
   Calzoni
c) How many orders were done during the week?
   50 Orders
d) What is the percentage of pizza orders?
   Percentage = 15/50x100 = 30%



Question 2:

Ten randomly chosen students were asked how many times they had missed class during a certain semester, the answers were as follows:

1 1 1 1 3 3 3 7 9 11

a) What is the Sample Mean (Arithmetic Mean)?

Sample Mean: $\overline{X} = \frac{\sum X}{n} = \frac{1+\ldots+11}{10} = 4$

b) What is the Median?

Median = (3+3)/2=3

c) What is the Mode?

Mode = 1

d) Based on the values of the arithmetic mean, median, and mode, what is the most likely shape of the distribution?

Mean > Median > Mode, then the distribution is positively skewed

e) Find the Sample Variance. (Round your answer to the nearest hundredth)

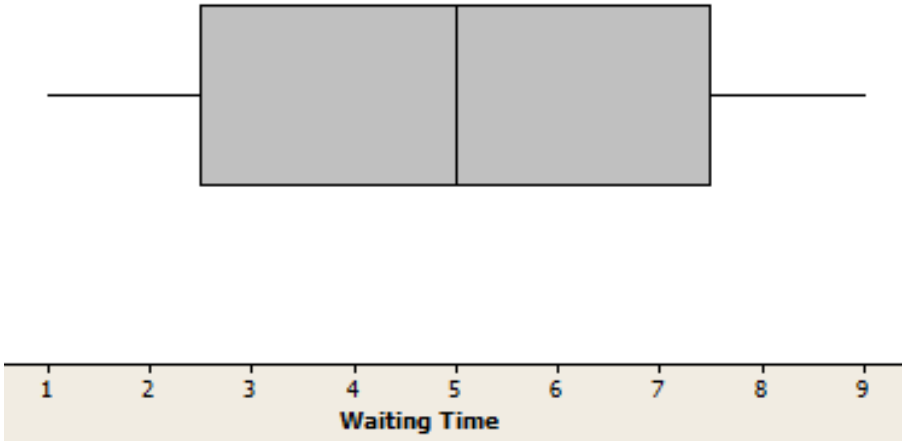
$(X-\overline{X})^2$

x	11	9	7	3	3	3	1	1	Total
$X-\overline{X}$	7	5	3	-1	-1	-1	-3	-3	0
$(X-\overline{X})^2$	49	25	9	1	1	1	9	9	122

$$S^2 = \frac{\sum (X-\overline{X})^2}{n-1} = \frac{9+..+49}{9} = \frac{122}{9} = 13.56$$

Question 3:

Consider below the boxplot for a sample of waiting time at a bus station. Use the boxplot to find the following:



a) Median

Median = 5 minutes

b) Lower Quartile

Q_1= 2.5 minutes

c) Upper Quartile

Q_3= 7.5 minutes

d) Minimum and Maximum

Minimum = 1 minutes

Maximum = 9 minutes

Question 4:

In a survey aiming to study the average number of credit cards owned by top CEOs, the following data was collected.

Number of credit cards: X	Number of CEOs: Frequency	Relative Frequency
0	3	3/100 = 0.03
1	25	25/100 = 0.25
2	35	35/100 = 0.35
3	30	30/100 = 0.30
4	7	7/100 = 0.07
Total	100	

a) Find the relative frequency for each value of X.

b) How many CEOs own more than two credit cards?

37 CEOs

c) What is the percentage of CEOs having less than two credit cards?

28/100 x100% = 28%

Question 5:

A hospital employs 200 persons on the nursing staff. Fifty are nurse's helpers, 50 are practical nurses, and 100 are registered nurses. A nurse's helper receives $8 an hour, a practical nurse $15 an hour and a registered nurse $24 an hour. What is the weighted mean hourly wage (pay)?

Weighted Mean = $\overline{X} = \frac{\sum wx}{\sum w} = \frac{w_1x_1 + w_2x_2 + w_3x_3}{w_1 + w_2 + w_3}$

= (50x8+50x15+100x24)/200

= 3550/200

= $17.75

Question 6:

A sample of the homes currently offered for sale revealed that the mean asking price is $75,900, the median $70,100. The sample standard deviation is $5,900.

a) What is the Pearson's coefficient of skewness? (Round your answer to the nearest hundredth)

$$sk = \frac{3(\overline{X} - Median)}{S} = \frac{3(75900 - 70100)}{5900} = \frac{17400}{5900} = 2.95$$

Describe the skewness of the distribution based on the computed coefficient.

The distribution is positively skewed.

Question 7:

Listed below are the commissions earned last week by a sample of 16 brokers working for an investment company.

$310	$200	$400	$390	$230	$205	$400	$209
$300	$190	$310	$200	$240	$305	$308	$280

a) What is the third quartile for the distribution of commissions?

$190	$200	$200	$205	$209	$230	$240	$280
$300	$305	$308	$310	$310	$390	$400	$400

$$L_P=(n+1)\frac{P}{100}$$

$$L_{75}=(16+1)\frac{75}{100}=12.75$$

$$Q_3 = 310+0.75(310-310) = \$310$$

b) What is the first quartile for the distribution of commissions?

$$L_{25}=(16+1)\frac{25}{100}=4.25$$

$$Q_1 = 205+0.25(209-205) = \$206$$

Question 8:

Consider below the monthly cost of electricity bill for 20 houses located in the same neighborhood during December. The data is grouped in the following frequency distribution table:

Class	Frequency (f)	Class Midpoint (M)	f.M	$M-\overline{X}$	$(M-\overline{X})^2$	$f.(M-\overline{X})^2$
\$85 up to \$95	2	90	180	-22	484	968
\$95 up to \$105	4	100	400	-12	144	576
\$105 up to \$115	7	110	770	-2	4	28
\$115 up to \$125	2	120	240	8	64	128
\$125 up to \$135	5	130	650	18	324	1620
Total	**20**		**2240**			**3320**

a) Copy the above table to your answer booklet and fill in the table.

Done Above

b) Find the sample mean of the monthly cost.

$$\text{Mean}=\overline{X}=\frac{\sum f.M}{n}=\frac{2240}{20}=\$112$$

c) Find the sample variance of the monthly cost. (Round your answer to the nearest hundredth)

$$\text{Variance}=S^2=\frac{\sum f.(M-\overline{X})^2}{n-1}=\frac{3320}{19}=174.74$$

The Yes/No and undecided responses to a survey question are broken down according to employment status and the sample results are given below.

	Response			
Employment Status	Yes	No	Undecided	**Total**
Employed	30	25	5	60
Unemployed	20	15	5	40
Total	50	40	10	100

a) If a person is selected at random, what is the probability that he is **unemployed**?

Probability = 40/100 = 2/5

b) If a person is selected at random, what is the probability that he says **No**?

Probability = 40/100 = 2/5

a) If a person is selected at random, what is the probability that he is unemployed **and** he says yes?

Probability = 20/100=1/5

b) **Given** that the selected person is unemployed, what is the probably that he is undecided?

Probability = 5/40=1/8

c) **Given** that the selected person says yes, what is the probably that he is employed?

Probability = 30/50 = 3/5

Question 10:

A survey of top executives revealed that 35% of them read Time magazine, 20% read Newsweek and 40% read U.S. News. There are 10% percent read both Time **and** U.S. News.

a) What is the probability that a particular top executive reads Newsweek?

Probability (Newsweek) = 20% = 0.2

a) What is the probability that a particular top executive reads **either** Time **or** U.S. News?

Probability (A or B) = Pr(A) + Pr(B) – Pr(A and B)

= 0.35 + 0.40 – 0.10 = 0.65

a) What is the probability that a particular top executive reads **neither** Time **nor** U.S. News? (Hint: Complement Event)

Probability = 1 – Probability (A or B) = 1 - 0.65 = 0.35