MAT 1190 Quantitative Reasoning Practice Exam II Spring 2015

Name_____

On the actual exam, there will be 10 questions each similar to one of the following and each worth 10 points.

1) Which of the following are not statements? Why?

A) $5 \times 5 = 10$ B) Don't leave early without first getting permission.

C) Who is your instructor? D) Jan and Ella are neighbors.

B,C

2) Determine whether each sentence is a statement or not.

i. $2 \times 3 = 0$

ii. Please don't yell.

iii. She went to Spain.

iv. Kel studied for hours.

YNYY

3) Classify each statement as simple or compound.

i. Jeff's brother is two years old.

ii. He is over six feet tall.

iii. His parents own two houses.

iv. He likes cats and dogs.

SSSC

4) Which of the following are compound statements? Why?

A) February is the shortest month.

B) If you don't use sunblock, you'll get burned.

C) He has a dog and a cat.

D) His eyes are neither blue nor brown.

BCD

5) Identify each of the following statements as a conjunction, disjunction, conditional, or biconditional.

If Jon fails this test, then he will fail the course.

The Johnsons will build a pool if and only if they win the lottery.

Tamika is taking history and economics.

We will ship our products either via railroad or on a boat which will pass through the Panama Canal.

Cond,B,Conj,D

6) Which of the following is a negation of the statement.

It is not true that my mother is from outer space

A) My mother is not from outer space.

B) My mother is from outer space.

C) It is true that my mother is not from outer space.

B

7) Which of the following is a negation of the statement.

Everyone at my house got the flu.

A) Someone at my house got the flu.

B) Not everyone at my house got the flu.

C) No one at my house got the flu.

B

8) Identify the quantifier in the statement as universal or existential. Then write the negation of the statement.

At least one breed of cat is hairless.

A) Universal, Some breeds of cat have hair.

B) Universal, All breeds of cat are hairless.

C) Existential, No breed of cat is hairless.
D) Existential, All breeds of cat are hairless.
C
9) Complete the following truth table.

p	q	$p \vee q$	$\sim(p \vee q)$	$\sim(p \vee q) \rightarrow p$
T	T			
T	F			
F	T			
F	F			

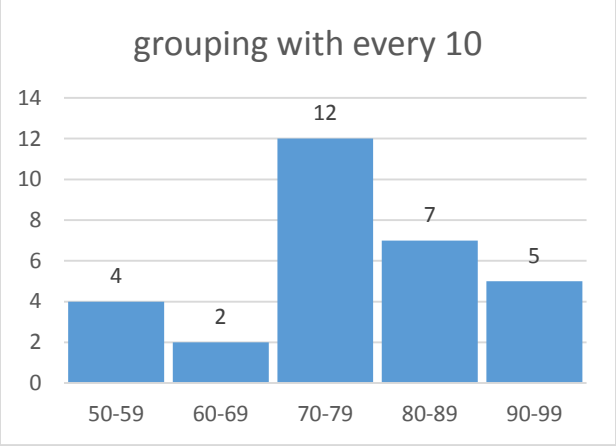
Last column is TTTF
10) Given that p and q are T and r is F substitute into the statement and evaluate its truth.

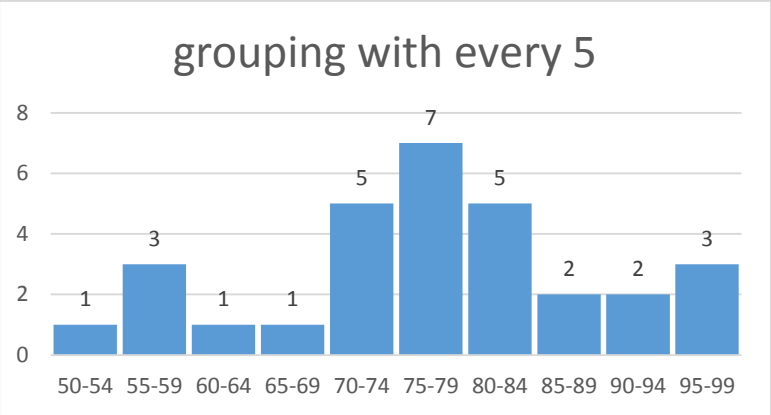
$(r \wedge q) \vee (\sim p \wedge q)$

After evaluating, you should get F
11) In order to help pay for college, the grandparents of a child invest $2650 in a bond that pays 12% interest compounded monthly. How much money will there be in 2.5 years?
$3571.80
12) Determine the better investment: 6% compounded monthly or 6.2% compounded semiannually (to get full credit, you must find the effective annual rate for both).
EARs are 6.17% and 6.30% respectively so the latter is a better deal.
13) Decide whether the probability described is classical or empirical.
Six out of thirty gorillas seen on a safari were female, so the probability of the next gorilla that is seen being female is 0.2.
empirical
14) Decide whether the probability described is classical or empirical.
A container contains 50 ping pong balls labeled 1 through 50. The probability of drawing a ball at random having a number 8 or less is 4/25.
classical
15) If a die is rolled one time, find the probability of getting a number greater than 1. To get credit, you must make use of complements.
1−1/6=5/6
16) If a die is rolled one time, find the probability of getting a number less than 4 or an even number. (To get credit, you must make of the equation relating union and intersection.)
½ + ½ − 1/6 = 5/6
17) Draw a tree diagram to determine the sample space when three coins are tossed.

18) Using the tree diagram you have drawn, find the probability that exactly two coins land tails up.
htt, tht, tth so 3/8
19) Three coins are tossed. Find the probability that at least one coin lands heads up. You must use complement to get credit for this problem.
1− 1/8=7/8
20) A single card is drawn from a standard 52-card deck. Find the probability of getting a 2 or a king. (To get credit, you must make of the equation relating union and intersection.)
4/52 + 4/52 – 0/52 = 8/52 = 2/13
21) The grades on a college math exam are shown below. Construct a stem and leaf plot for the data with 5 stems (grouping every 10) and with 10 stems (grouping every 5). Also describe any skewing.

79	78	56	81	73	63
54	70	71	83	79	99
84	85	92	74	95	76
90	80	78	95	85	81
75	66	78	57	73	59

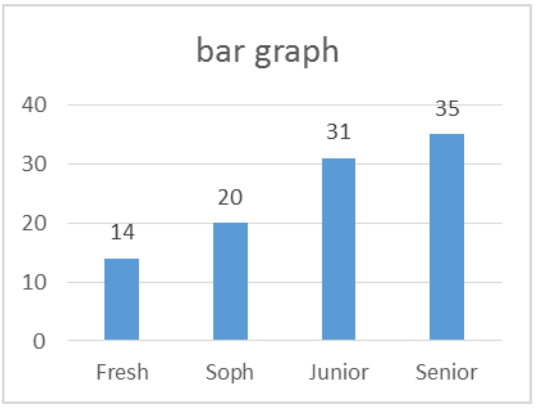




These are histograms but you can use them to check that your stem and leaf diagrams are correct. The skewing is a bit tough to decide. The median is 78 and the mean is 80, which points to a skewing to the right. Even though the left side has a longer tail, the right side has a fatter and bigger tail so wins out.

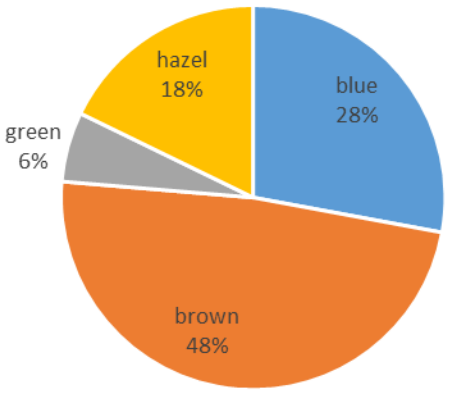
22) The following frequency distribution shows for a certain high school the percentage of smokers who are freshmen, sophomores, juniors, and seniors. Construct a bar graph for the data on the graph paper provided.

Freshmen	14
Sophomores	20
Juniors	31
Seniors	35



23) Construct a pie chart for the following information.

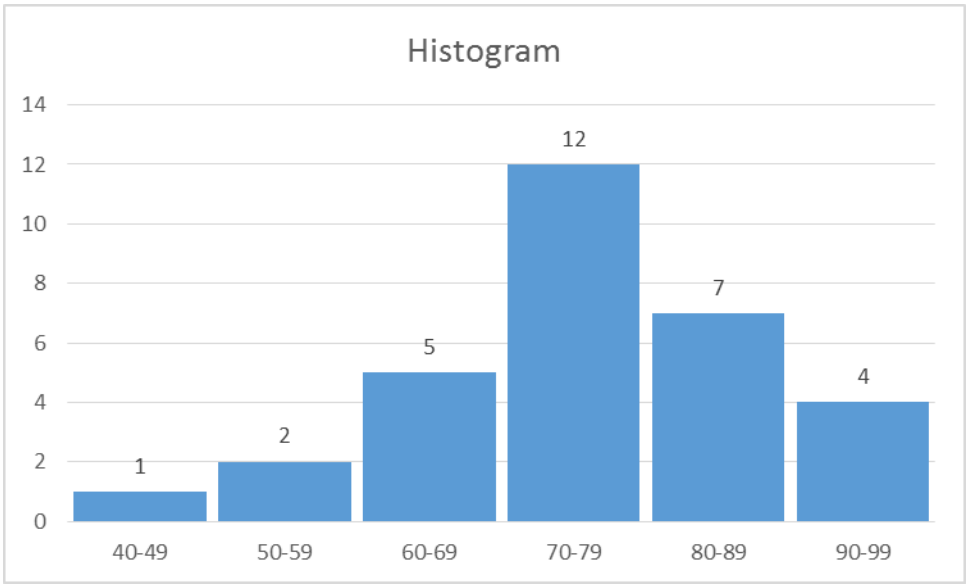
Eye color	Number
Blue	513
Brown	890
Green	108
Hazel	327



eye	f	%	angle
blue	513	28%	100
brown	890	48%	174
green	108	6%	21
hazel	327	18%	64
	1838		

24) The exam grades of 31 students were used to obtain the frequency distribution below. Construct a histogram for the data on the graph paper provided. Also comment on any skewing.

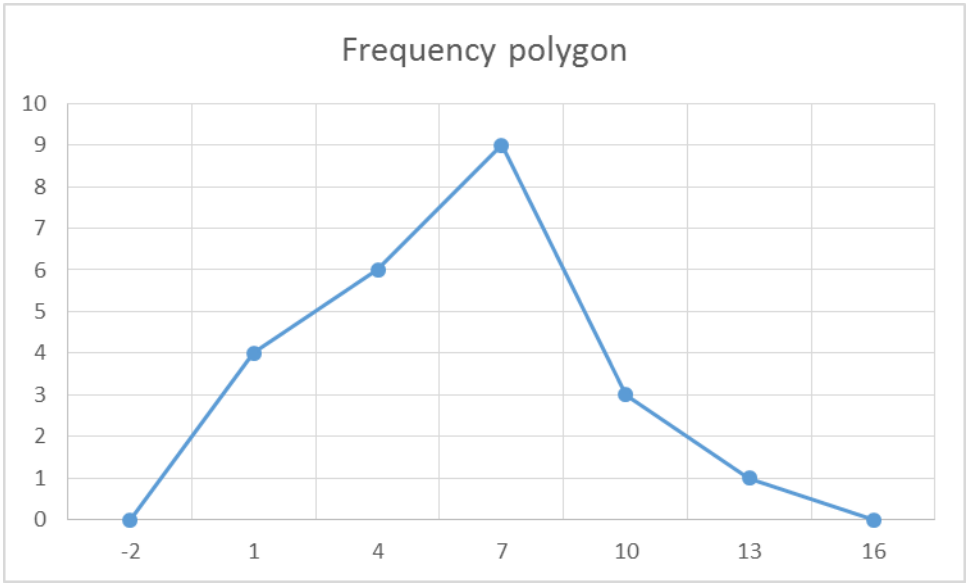
Class	Frequency
40-49	1
50-59	2
60-69	5
70-79	12
80-89	7
90-99	4



Data is skewed to the left.

25) To obtain the frequency distribution below, 23 babies were monitored for how many times they cried during the night. Construct a frequency polygon for the data on the graph paper provided.

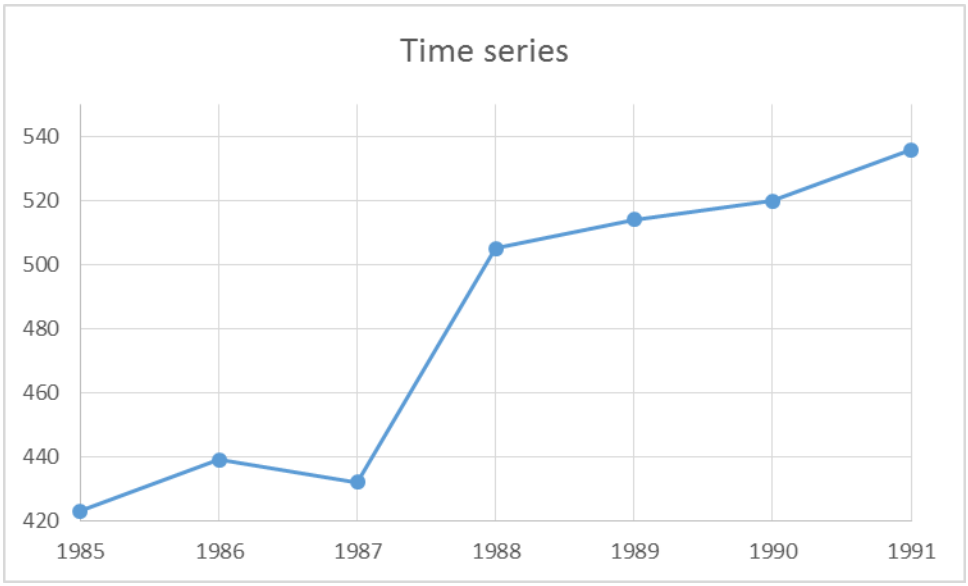
Class	Frequency
0-2	4
3-5	6
6-8	9
9-11	3
12-14	1



26) These data represent the number of students enrolled at a middle school. Draw a time series graph for the data. When did the greatest increase occur? If the trend from 1990 to 1991 continued, what would be the size of the student body in 1992 (to get credit, you must define 2 variables, create a linear eqation and then subsititute in 1992 to get the size).

Year	1985	1986	1987	1988	1989	1990	1991
Number	423	439	432	505	514	520	536

From the graph below, we see that the greatest increase occurred between 1987 and 1988. If the trend of 1990-91 continues: e=enrollment, t=time in years then e-536=16(t-1991) so if t=1992, then e=536+16(1992-1991)=552.



27) For the following data set, find the mean, median, mode and midrange and comment on skewing.

22 16 8 14 16 13 14 34

17.125	mean
15	median
16	mode
21	midrange

Since mean > median, then skewed to right.

28) These data represent the grades on a college exam. Find the approximate mean and the range of possible values for the median. Comment on any skewing. The mean is approximately 77.6 and the median could be anything between 70 and 79. If we say 74.5 then we have skewing to the right. However, it is more likely to be in the upper part of the range, so I would say that there is no skewing.

Class limits	Frequency
50-59	5
60-69	8
70-79	19
80-89	16
90-99	10

29) Find the range, variance and standard deviation for

5 40 6 45 26 4 28 46

Range is 41, variance is 325 and standard deviation is 18.

30) Mary borrowed at 6.5% simple interest enough money to buy a used car costing $6200 including tax. If she plans to pay off the loan over 3 years, find her monthly payments.

Mary's monthly payments will be $205.81.(Note that this is very unrealistic. In general, you pay interest ONLY on the part of the loan that is left. So the interest will decrease over time and the amount that you would pay would be quite a bit less than this. There are formulas in the compound interest section that you could use to calculate a more realistic monthly payment.)