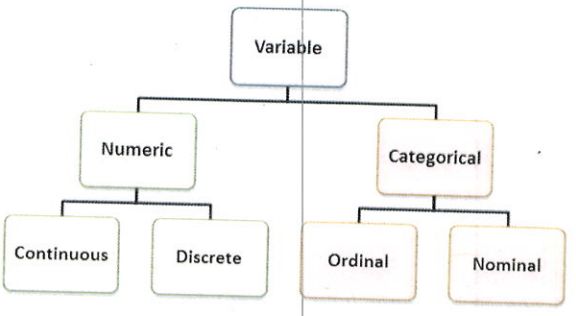
MAT 223, Written Homework #1, Spring 2017 Name KEY

Instructions: Show all work on paper and attached work sheets to this cover page. If you use a calculator to perform the operations (where problems do not instruct you to complete them by hand), say which steps/commands were used to count as work. Give exact answers where possible. In other cases, round dollars to pennies. All other situations, follow standard rounding rules for means and standard deviations, or round to 4 places unless instructed otherwise in the problem.



Scale/Levels	Basic Operations	Permissible Statistics
Nominal	Determination of Equality	Number of cases Mode
Ordinal	Determination of greater or less (rank)	Median Percentiles
Interval	Determination of equality of intervals	Mean Standard Deviation
Ratio	Determination of equality of ratios	Coefficient of variation

1. Complete the table below to categorize each of the variables. The charts and table above may be of some help. Check the appropriate box.

Variable	Categorical	Quantitative	Discrete	Continuous	Nominal	Ordinal	Interval	Ratio
Test Grade	✓ (letter)	✓ (or percent)		✓ (Quant)		✓ (Cat)		✓ (Quant)
Country	✓				✓			
Year		✓	✓				✓	
Volume		✓		✓				✓
Cost		✓		✓				✓
Produce	✓				✓			
Purpose	✓				✓			
Latitude		✓		✓			✓	
Rainfall		✓		✓				✓
Gender	✓				✓			
Political Party	✓				✓			

2. Describe how you can tell the difference between a quantitative and a qualitative variable.

3. Describe how you can tell the difference between an interval level of measurement and a ratio level of measurement.

4. Describe how you can tell the difference between a discrete and continuous variable.

5. Why is your credit card number not a quantitative variable, even though it's a number?

6. Describe three variables at each level of measurement that you might want to measure for an elementary school student.

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2. If the result is not a number, it is qualitative. If it is a #, one test you can do is determine if the average (mean) is meaningful. If it is not, it's qualitative. (answers may vary)

3. Calculate the ratio and determine if the ratio is meaningful. eg. for GPA is 4.0 "twice as good" as 2.0? Is a temp of 60° "twice as warm" as 30°? The answer in both cases is 'no', so these are interval measures.

4. Can the number be expressed as fractions or decimals? Then if yes, call it continuous. If fractional pieces are meaningless (like # of things/people) then it is discrete.

5. It does not mean anything to average credit card #'s. Your card number is a pointer to <u>you</u> and you are not a #.

6. nominal - gender, ethnicity, school attended (answers will vary)
ordinal - rank in class, letter grade on an exam, birth order
interval - GPA, IQ, body temperature
ratio - height, weight, age