MAT 1190   Quantitative Reasoning   Practice Exam I Spring 2015

- Write answers and work in the BLUE BOOK. You may write on exam but nothing on it will be used for grading.
- Write the questions in the order in which they appear on the exam. If you want to skip a problem, leave space for the answer and then come back to it.
- There will be extra blue books, so you may ask for one at any time during the exam.
- Use COMPLETE sentences and finish word problems with a SENTENCE answering the question posed. Make sure you include any units.
- Actual exam will have 12 or 13 questions, so each is worth about 8 points.
- These questions will be posted in the "discussion" section of the openlab so that you can get class participation points. Please just answer one question. You may also provide a correction and/or alternative solution for credit.

Day 1

1. Solve $\dfrac{x}{6}+\dfrac{3x}{2}=\dfrac{4}{5}-\dfrac{2x}{15}$ To get credit, you must find the LCD and clear all the denominators.

2. The formula for the distance traveled during a period of constant acceleration is $d=\dfrac{1}{2}at^2$, solve the formula for a.

3. Prof Halleck is teaching 2 sections of quantitative reasoning with a total of 64 students. If one section has 8 more students than the other, how many students are in each section? To get credit you must define a variable and create a linear equation.

4. A nurse is told to give a patient recovering from surgery a total of 15 units of a potent antibiotic over 3 days. The dosage should be cut in half the second day and then reduced by one additional unit for the 3rd day. How many units should she administer on the first day? To get credit you must define a variable and create a linear equation.

Day 2

5. Solve $\dfrac{2}{x-2}=\dfrac{5}{x+9}$

6. The ADA reports that 11 out 25 people do not eat breakfast. If there are 175 students in a large lecture hall, about how many did not eat breakfast
   a. Solve by the method of proportions (define 1 variable).
   b. Solve by the method of direct variation. Define 2 variables, write an equation and identify the constant of proportionality.

7. In Karate, the force needed to break a board varies on inversely with the length of the board. If it takes 10 lb of force to break a board that is 2 feet long. How much force is needed to break a 5 ft board? Define 2 variables, write an equation and identify the constant of proportionality.

Day 3
8. Solve and graph the solution on a number line: 0 < 5(3-2x) < 25
9. On her first 3 tests, Julia got 85, 72 and 90. What is the range of scores Julia can get on her final exam (weighted twice) for a B in the course (average between 80 and 89). You must solve the problem by defining a variable (not x) and setting up a sandwich inequality.
10. Alan's grandma uses a pay-as-you go plan for phone service with an access fee of $19 per month and a flat per-minute rate of $.05. A competing plan is $30 per month unlimited voice. How many minutes must the grandma speak per month before the unlimited plan is cheaper? You must solve the problem by defining a variable (not x) and setting up an inequality.

Day 4
11. Solve $\begin{matrix}x-3y=6\\4x+3y=9\end{matrix}$ using the substitution method

12. Solve $\begin{array}{l} x+2y=-4 \\ 2x-y=7 \end{array}$ using the addition method

13. Solve using a system of equations. You MUST define TWO variables! (Do NOT use x and y.)
    As a fund raiser and educational activity for Valentine's Day, the No Sugar Club (NOSC) sold red roses for $6 and 8 oz bags of red pistachios for $5. If they sold a total of 113 items and grossed $626, how much of each item did NOSC sell?
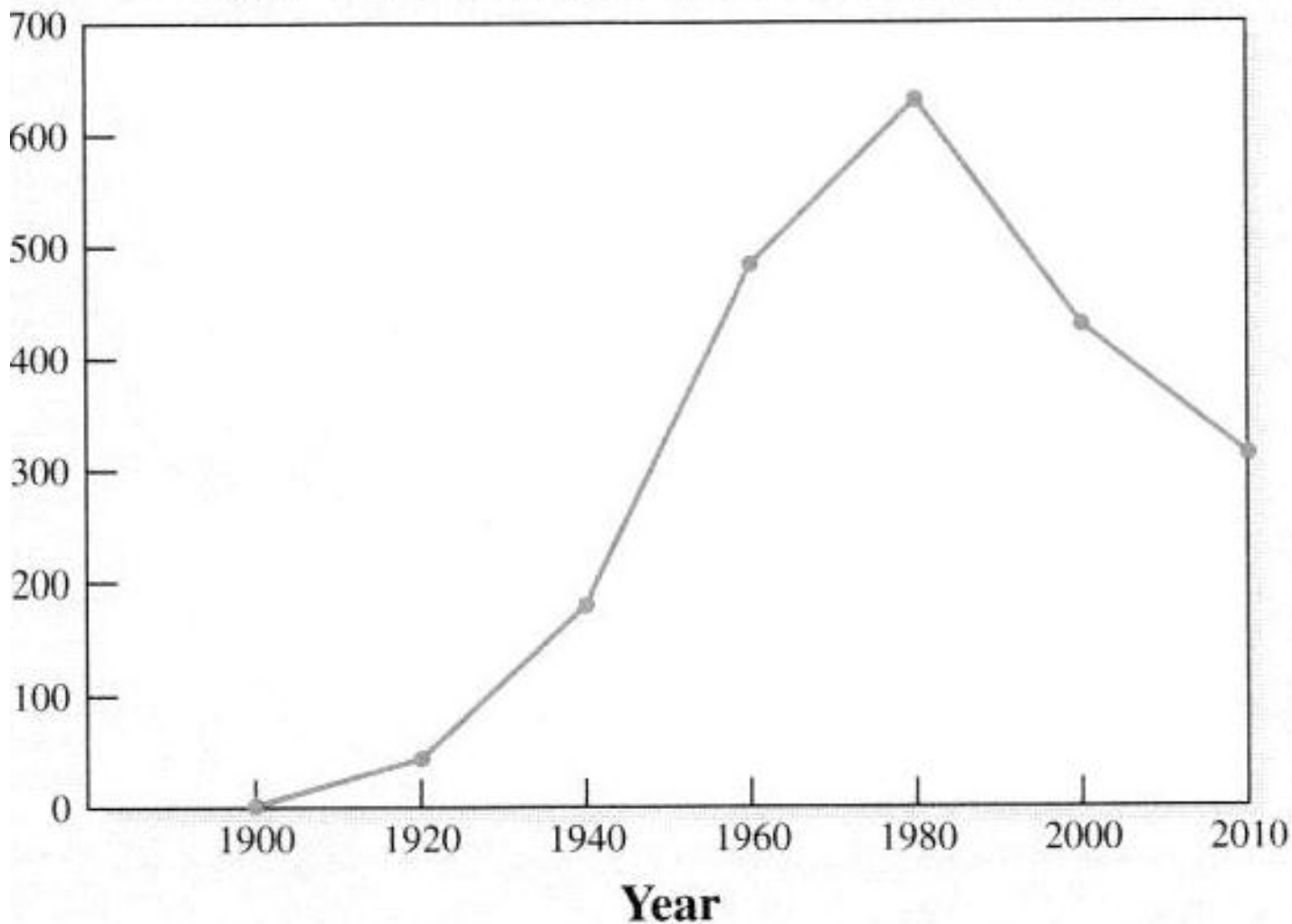
Day 5
14. Explain what deductive reasoning is and give an example.
15. Explain what inductive reasoning is and give an example.

Day 6

Cigarette Consumption in the United States

16. Identify the 20 year period of largest growth and find the rate (units should billions per year). Write a sentence.
17. Identify the 20 year period of largest decline and find the rate (units should billions per year). Write a sentence.
18. Use the data from 2000 to 2010 to predict the cigarette consumption in 2015. Write a sentence.

Day 7
19. Identify whether the quantifier is universal or existential and provide the negation.
    a. Everyone who buys this hat gets a free bowl of soup.
    b. Some people who live in glass houses throw stones.
20. Given p = "The plane is on time." and q = "There is a thunderstorm.", write the statements in words
    a. p ∧ ~q
    b. q ⟷ ~p

Day 8

21. Let p be true and let r be false. What does q have to be in order for the proposition (p ∧ ~q) → r to be false?
22. Make a truth table for
    a. ~p → ~q
    b. ~p v q

Day 9

23. Dale has 2 coupons. One is $25 off and the other is 15% off. If the price of the suit he has selected is marked as $149. Which one should he use?
24. A jacket that originally retailed for $89 has been marked down as part of clearance to $37. By what percent has the price been lowered?
25. Lane's expenses for college are $7,800 for tuition, $3,600 for housing, $2,600 for food, $1,500 for transportation and $1000 for miscellaneous (books, entertainment). Create a table and calculate the % of Lane's budget taken by each category. Make a pie chart and label.

Day 10

26. Jose borrows $12,000 from his brother Fernando and promises to pay off just the interest (4%) while he is in college. Write an equation expressing the amount of interest he will be pay as a function of time (years) in school. Over the course of the 4 years at school, how much interest will Jose pay?
27. Wanda's little sister Jacqueline had an urgent need for some cash but had no way until the summer to begin paying it off. Being mean, Wanda charges the shark rate of 2% per month but in a last minute pang of conscience she allowed the interest to be simple rather than compounded. Write an equation expressing the total amount owed by Jacqueline as function of time in months (from October 1). If the loan happened at the beginning of the fall (October 1), how much will Jacqueline owe at the beginning of the summer (July 1)?