Final Exam  
Math 1.95 Fall 2008

Answer ten of the following questions. Each problem is worth 10 points.

You must work the problems as directed and show all work to receive full credit.

1. Perform the following tasks:
   a) Convert the repeating decimal 0.257575757... into a common fraction (a fraction of the form a/b, where a, b are whole numbers).
   b) Convert into a reduced common fraction and a percentage: twenty-five thousandths.
   c) Place the following numbers in order (least to greatest): 0.1 $\frac{2}{13}$, 0.1222, 1/9, and 1/8.

2. In a certain class of 50 students there are 17 female students, 10 left-handed students, and 25 right-handed male students.
   a) How many right-handed students are there?
   b) How many of the males are left-handed?
   c) What percentage of the students are left-handed females?

3. Perform the following computations.
   a) 6 hours, minus 3 hours 14 minutes 46 seconds. Express your answer in hours, minutes, and seconds.
   b) Convert 218 to a number in base SIX.
   c) Consider the number 1253$_{zzz}$, where "zzz" is some scribble you cannot read. Do not assume that "zzz" is a three-letter word. If "zzz" indicates the base, what is the least possible value of 4213$_{zzz}$? Explain.
   d) Find the next two numbers in the sequence: 44$_{eight}$, 55$_{eight}$, 66$_{eight}$, ...

4. There are 16,287 students at Brooklyn College. Suppose one student at random will be picked and given a full scholarship.
   a) What is the probability that you will win the scholarship?
   b) Explain the flaw in the following reasoning: "Since there are 26 letters in the alphabet, the probability that the student receiving a full scholarship has a name beginning with 'R' is 1/26."
   c) There are 1195 students in the Elementary Education program. What is the probability that one of them will win the full scholarship?

5. The tax refunds for ten people chosen at random were:
   $400 $400 $400 $1000 $400 $400 $400 $5000 $5000 $400
   a) Find the mean, median, and mode of this set of data.
   b) One group claims that the average refund was over $1000, while another claims that the average was $400. Can both statements be correct? Explain.
6. Answer the following questions.
   
a) Find the Greatest Common Divisor of the numbers 2021 and 2773.

b) Find the Least Common Multiple of the numbers 2021 and 2773.

c) Suppose \( N = 12389253 \times 3507 + 4200 \). Without multiplying and dividing, find the quotient and remainder when \( N \) is divided by 3507.

d) Suppose \( N = 12389253 \times 3507 + 4200 \). Without multiplying and dividing, determine if \( N \) divisible by 7. Show your work.

7. In the figure below, assume the grid points are 1 inch apart.

   ![Grid Figure]

   a) Determine the area of the figure.

   b) Determine the perimeter of the figure.

   c) Draw all lines of symmetry for the figure.

8. The questions refer to the figure below. You may assume that AEGJ is a rectangle, and that the figure is formed by rigid transformations of trapezoid ABCD.

   ![Figure with labeled points]

   a) Identify the specific rigid transformation needed to produce trapezoid EFCD from trapezoid ABCD.

   b) Draw the image of the reflection of ABCD along BC.

   c) Suppose AE is 17 inches and AJ is 11 inches. Find the area of trapezoid ABCD.

9. A new employee is hired at a starting salary of $3000 per month. She gets a $200 raise every month.

   a) What will her monthly salary be after working for 12 months?

   b) How much will she have earned altogether at the end of five years (after 60 months of working)?
10. For this question, consult the following figure of a rectangular solid.

![Diagram of a rectangular solid]

a) Identify this solid (i.e., what type of solid is it). Explain your reasoning.
b) How many edges does this solid have?
c) How many of the edges are perpendicular to BC?
d) Suppose AB = 12 cm, BC = 4 cm, and BD = 5 cm. What is the surface area of the solid?

11. A student writes the following for the division of 9893 by 47:

\[
\begin{array}{c|ccc}
47 & 9893 \\
\hline
\text{-}4700 & 5193 \\
\text{-}4700 & 493 \\
\text{-}470 & 23
\end{array}
\]

= 210 remainder 23

a) Explain why this algorithm works (if it works at all).
b) Use this algorithm to divide: 5793 ÷ 26.