Show work where appropriate in order to receive full credit.

1. [3 pts] Complete each sentence with the correctly spelled term:
   (a) The name of our modern system of numeration is...
   (b) The originator of the “Sieve” was...
   (c) A number that is not prime is called...

2. [6 pts] Convert to Roman numerals:
   (a) 1,464
   (b) 890

3. (a) [3 pts] Write the three Roman numerals that immediately follow MCLXXXVIII.
   (b) [3 pts] Write the three Roman numerals that immediately precede MCLI.

4. [6 pts] Create the both the largest and smallest possible Roman numerals using all the
digits in each group below. Specify which is which. If not possible, tell why.
   (a) CXMDIIV
   (b) LIDVILXX

5. (a) [6 pts] Subtract entirely in Roman, showing all “borrows”: DV minus CCLXVII.
   (b) [6 pts] Multiply entirely in Roman, showing all steps of the Instructional Algorithm: LXI times VI. Turn the page sideways if you need more space.
6. [15 pts - 5 each] Determine whether each statement below is true or false, justifying your response with an appropriate type of argument.
   (a) $24 \mid 6$
   (b) There are numbers that are divisible by 4 but not by 12.
   (c) The LCM of an even number and any other number is always even.

7. [8 pts] Make up a number strictly between 200 and 300 that you know is divisible by 12 but not 5, explaining your work.

8. [3 pts] Demonstrate an appropriate divisibility test in determining whether 384 is divisible by 7.

9. [5 pts] Clearly demonstrate the Prime Number Test in determining whether 593 is prime or not.

10. [8 pts] If $a$ and $b$ are relatively prime and have LCM equal to 60, find all possible pairs of values for these two numbers. Show clear, organized work, and briefly explain.
11. [6 pts] Find the prime factorization of $(8500)^2$ by any method. Show clear work. Turn the page sideways if you need more space.

12. [12 pts] Find the GCD of the numbers below, using a different method for each pair. Show clear work but do not explain.
   (a) 12 and 501
   (b) 8500 and $2^2 \cdot 13 \cdot 25^2$

13. [10 pts] Now find the LCM of the same pairs of numbers, again using a different method for each pair. (However, you may repeat methods you used above in finding the GCDs.) Show clear work but do not explain.