Review Math 130 Midterm #2 Fall 2010

For this midterm, you should review your homework problems, journal problems, problems on worksheets (exponents, fractions, operations on fractions and mixed numbers, LCM and GCF) and the following activities done in class: 4R, 8O, 8Q, 8K, 8L, 8G, 2K, 5D, 5E, 6S, 6R, 9D.

You should also know how to prove the following:
-lemma 2.5 p. 114
-lemma 3.2 p. 119
-theorem 4.5 p. 123
-divisibility tests for 4, 8, 3, and 9

The following problems have been collected from previous exams.

1. Shanna made some cookies. She sold $\frac{3}{5}$ of them in the morning and $\frac{1}{4}$ of the remainder in the afternoon. If she sold 150 more cookies in the morning than in the afternoon, how many cookies did she sell in all?

2. Find the larger fraction without converting to decimals or finding a common denominator. Explain your reasoning.

   (a) $\frac{52}{54}$ $\frac{61}{63}$
   (b) $\frac{19}{81}$ $\frac{27}{99}$

3. Give an algebraic proof that the product of two odd numbers is always odd.

4. Let m and n be whole number with $m > n$. Write the prime factorization of
$$\frac{45^m 21^{(n+3)}}{35^n}$$

5. Is 271 a prime? Is 273 a prime? Show your work. (Hint: $17^2 = 289$)

6. What are the different ways the tens digit A and the ones digit B in the number 631872AB can be so that the number will be divisible by 9? Show your reasoning.

7. Why do we not talk about the greatest common multiple and the least common factor?

8. Expand and simplify the following completely.

$$(a + 3b)^3$$

9. Miriam gave $\frac{3}{8}$ of her money to Alex and Hannah gave Alex \$20. Alex now has \$73. How much did Miriam have to begin with? Give a teacher's solution.

10. Write a story problem that has $\frac{\frac{1}{2} \cdot \frac{1}{3}}{5}$ as it solution. Give a teacher's solution to your story problem.

11. Show that if two numbers are divisible by 3, their sum is divisible by 3.

12. Write a story problem whose answer is $GCF(18, 24)$. What is $GCF(18, 24)$?

13. Write a story problem whose answer is $LCM(18, 24)$. What is $LCM(18, 24)$?