**Review Sheet for Exam III in Math 303**

1. Fill in each blank with the appropriate word, phrase, or symbols.

(a) Let *A* and *B* be two finite sets such that *n*(*A*) = *a* and *n*(*B*) = *b*. Then *a* ∙ *b* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(b) If *m* | *n*, then *m* is said to be a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of *n*.

(c) If *a* | *b*, then there is a natural number *c* such that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(d) The numerals 6 and 5 in the addition number sentence 6 + 5 = 11 are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(e) If *xy* = *z*, then *z* is said to be a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of *x*.

(f) If *GCD*(*a*, *b*) = 1, then *a* and *b* are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(g) For a fraction , the *a* is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. State the correct property of integers that justifies the change from the preceding step.

–(–4) = –(–4) + 0 (a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

= –(–4) + [4 + (–4)] (b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

= –(–4) + (–4 + 4) (c) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

= [–(–4) + (–4)] + 4 (d) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

= 0 + 4 (e) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

= 4 (f) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (g) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

=  (h) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

=  (i) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

=  (j) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

=  (k) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

=  (l) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Write the set definition for the addition of whole numbers.

4. Write the definition of a prime number.

5. Is 91 a prime or a composite? Justify your answer.

6. (a) Find the prime factorization of 126. (b) Find set of all natural number factors of 126.

7. Given 12 and 18, use the set intersection method to find the following:

(a) Find the least common multiple. (b) Find the greatest common divisor.

8. Given 60 and 126, use the prime factorization method to find the following:

(a) Find the least common multiple. (b) Find the greatest common factor.

9. Given 966 and 230, use the Euclidean Algorithm to find the greatest common factor.

10. Calculate each of the following problems.

(a) –7(4) (b) –2(–8 – 7)

(c) –31 + 17 (d) –2(3)(–4)

(e) –33 ÷ (–11) (f) 3 + (–4) + 5 – 9 – (–7)

(g) 9 – (–12) (h) –16 + (–18)

11. Complete the illustration by filling in the empty oval. Write the mathematical sentence, for the model being illustrated, in terms of an operation on integers.

(a) (b)



12. Use a measurement model to illustrate and solve each problem.

(a) –3 + (–2) + 4 (b) –4 – (–3)

13. Write each problem as a mathematical expression, compute the answer, and write the solution.

(a) While playing a game of cards, Pat was eight points in the hole. Pat then earned four points before losing six points. What was Pat’s score after losing the six points?

(b) For 2008, Integer Manufacturing had income of $43 million and expenses of $61 million. The partnership’s charter states that all profits and losses are to be shared equally among the six owners. What is each owner’s share of the profits or losses?

(c) The temperature was 2° below zero yesterday and the temperature is 6° below zero today. What was the temperature change from yesterday to today?

(d) For the past thirty-eight days, Green Bean Coffee Shop's stock value had a net loss of $716 per day. How much more or less was the value of the stock thirty-eight days ago?

14. Find the multiplicative inverse for –.

15. True or false. The multiplicative inverse for  is  for all whole numbers *a* and *b*.

16. Write three other fractions that are equivalent to .

17. Express  in simplest form.

18. Express the following problems in terms of an operation on rational numbers, then use an appropriate model to illustrate the problem. Make sure you use a complete sentence to write the solution of the problem.

(a) Terry ate two-third of a pizza one day and three-fourths of a pizza the next day. How much pizza did Terry eat over the two days? (Assume the whole pizzas were the same size.)

(b) Three-fourths of a pan of brownies was setting on the kitchen table. Jerry and Terry ate two-thirds of that partial pan of brownies. What portion of a pan of brownies did they eat?

19. (a) Compute  with a method (b) Compute  with a method other than   
 that does not use improper fractions. invert-and-multiply.

20. Solve each problem. Write the solution in a complete sentence.

(a) Kim ran three and two-fifths miles, then ran another four and three-fourths miles. How far did Kim run altogether?

(b) You need to lay tile across a wall. Each side of a square tile measures two and seven-eighths inches. If the wall is 35 inches wide, how many pieces of tile are needed?

(c) Lynn assumes that it will take one-sixth as much material to make a dress for her daughter as for herself. If a dress pattern requires three and three-fourths yards of material to make a dress for herself, how much material must Lynn buy to make matching dresses for her daughter and herself?