Math 210 - Dr. Miller - Exam #2, Version #1 - 3/25/09

1. *[4 pts]* Complete this sentence to illustrate the constructivist definition:

   $7 \times 3 = 21$ *because* ...

2. *[8 pts - 2 each]* Fill in each blank with the correctly spelled term:

   (a) In the number sentence $13 - 5 = 8$, the answer, 8, is called the

   _____.

   (b) In the number sentence $24 \div 8 = 3$, the number 24 is called the

   _____.

   (c) In the number sentence $9 \times 4 = 36$, the numbers 9 and 4 are called the

   _____

   while the answer, 36, is called the

   _____.

3. *[6 pts]* Circle the computation that is impossible, then use your choice of definition or division model to clearly explain why.

   $3 \div 0$ $0 \div 3$

4. *[6 pts - 3 each]* For each word problem below, write the complete number sentence it requires and the name of the model (i.e., "take away") that it demonstrates.

   (a) Rani has 3 colors of icing and 5 types of sprinkles to use in decorating her cupcakes. How many different combinations can she make?

   (b) Tran has 18 tomato plants to put in rows of 6 each. How many rows can he plant?

5. *[6 pts]* Convert, showing clear work: $2038_{seventeen} = \underline{\qquad\qquad}_{ten}$

6. (a) *[3 pts]* List the three numerals that immediately follow $5TT_{twelve}$ in base twelve.

   (b) *[3 pts]* List the three numerals that immediately precede $5TT_{twelve}$ in base twelve.

7. *[6 pts]* Refer to the concept of place value in explaining why we do not use the digit "4" in base four.

8. *[10 pts]* Add entirely in base twelve, showing clear work: $2T4 + 881 + 909 + 1362 + 4T44$

9. *[10 pts]* Multiply entirely in base six using any algorithm you choose, showing clear work: $425_{six} \times 32_{six}$

10. *[12 pts]* Divide entirely in base seven, showing clear work: $13600_{seven} \div 52_{seven}$

11. *[8 pts]* Subtract entirely in base sixteen using the "balancing" algorithm, showing clear work: $6986_{sixteen} - 72A_{sixteen}$

12. *[6 pts]* Is the set $\{2, 3, 5, 6\}$ closed under multiplication? Explain.

13. *[12 pts - 3 each]* Finish the number sentence to demonstrate each required property. Do not demonstrate any other properties than the one requested.

$$8(7 + 6) + (5 + 4) = \underline{\quad (?) \quad}$$

(a) The Commutative Property of Multiplication

(b) The Identity Property of Addition

(c) The Associative Property of Addition

(d) The Distributive Property of Multiplication over Addition