

Math 200 - Test 2

March 10, 2010

Name _____

Score _____

Show all work. Supply explanations where necessary.

- (1 point) Choose the division model that best fits the following problem situation:
Joleen has 8 cups of flour that she will use to make cookies requiring 2 cups of flour per batch. How many batches of cookies can Joleen make?
 - set partition model
 - repeated subtraction model
 - missing factor model
 - charged field model
- (1 point) Which one of the following is not a correct base-eight numeral?
 - 1001_{eight}
 - 1278_{eight}
 - 70701_{eight}
 - 1050700_{eight}
- (1 point) Choose the multiplication model that best fits the following problem situation:
Rodger has 4 different coats and 8 different scarfs. How many coat/scarf combinations does he have?
 - area/array model
 - number line model
 - repeated addition model
 - Cartesian product model
- (1 point) Which one of the following is not a basic property of the Hindu-Arabic numeration system?
 - Each number is either prime or composite.
 - Place value is based on powers of 10.
 - Each digit in a numeral has a face value, a place value, and a value.
 - All numerals are constructed from the 10 digits.
- (1 point) If $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 6, 8\}$, how many elements are there in $B - A$?
 - 0
 - 2
 - 4
 - 8

6. (4 points) Suppose that U is the set of all Americans, T is the set of all American teachers, and M is the set of all American males.
- (a) Describe an element of $\overline{M} - T$.

 - (b) Describe an element of $T - M$.

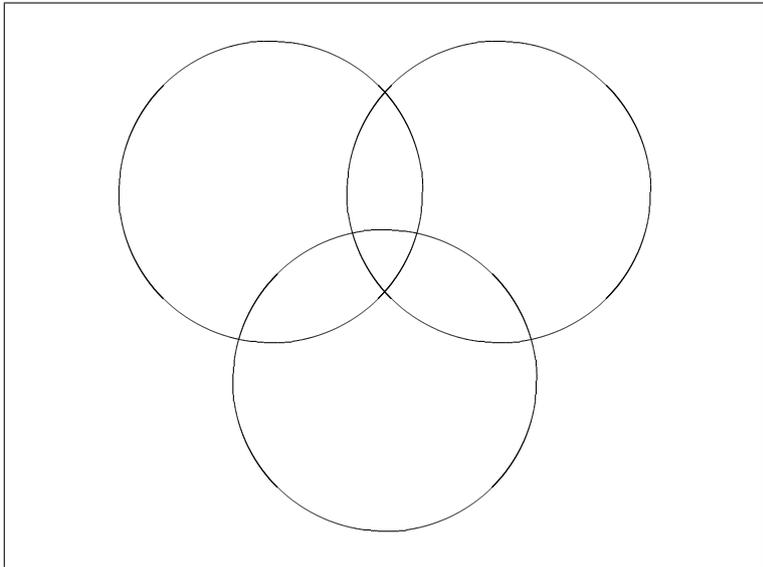
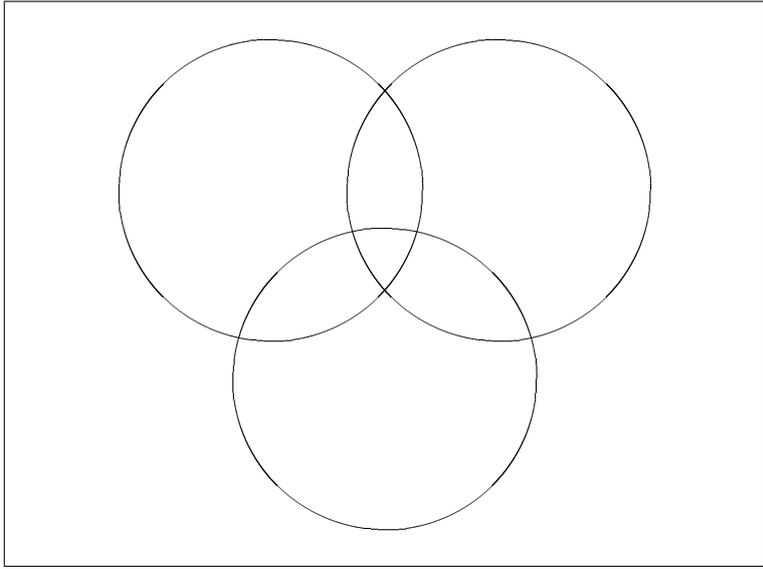
 - (c) Describe an element of $M \cup T$.

 - (d) Use set notation to name the set of all American male teachers.
7. (3 points) Rewrite each expression using the indicated property, and only that property, exactly one time.
- (a) *Distributive Property of Multiplication over Subtraction:* $5x - 15xy$

 - (b) *Commutative Property of Multiplication:* $5 \cdot (4x + 6)$

 - (c) *Associative Property of Addition:* $(2x + 6) + 5y$
8. (2 points) Use a three-set Venn diagram on the next page (one for each part) to shade the region corresponding to each of these sets. Label your diagrams.
- (a) $A \cap B \cap \overline{C}$

 - (b) $A \cup (B \cap C)$



9. (6 points) Ms. Baxter asked the 42 students in her two kindergarten classes to name their favorite small pets. Here is what she found:

- 23 said tarantulas
- 14 said geckos
- 19 said hermit crabs
- 5 said tarantulas and geckos
- 11 said tarantulas and hermit crabs
- 4 said geckos and hermit crabs
- 3 said all three

(a) Use a three-set Venn diagram to organize this information.

(b) How many children did not name any of these pets?

(c) How many children named exactly one kind of pet?

(d) How many children named tarantulas but not geckos?

10. (1 point) Which one of the following sets is closed under addition?
- (a) $\{0, 1\}$
 - (b) $\{1, 3, 5, 7, \dots\}$
 - (c) $\{1, 2, 4, 8, 16, \dots\}$
 - (d) $\{0, 3, 6, 9, 12, \dots\}$
11. (1 point) Choose the subtraction model that best fits the following problem situation: *There are 5 children in the first row and 2 children in the second row. How many more children are in the first row?*
- (a) take-away model
 - (b) set partition model
 - (c) missing addend model
 - (d) comparison model
12. (1 point) What is the face value of the digit 4 in the numeral 51435_{six} ?
- (a) 6^2
 - (b) $4 \cdot 6^2$
 - (c) 4
 - (d) 100
13. (1 point) Choose the division model that best fits the following problem situation: *To determine 56 divided by 8, Joe asked himself what times 8 is 56.*
- (a) set partition model
 - (b) repeated subtraction model
 - (c) missing factor model
 - (d) division algorithm
14. (3 points) Convert 110111_{two} to base ten. You must show work to receive credit.
- (a) 55
 - (b) 122
 - (c) 54
 - (d) 110

15. (2 points) Instead of saying that $0 \div 0$ is not defined, some teachers prefer to say it is indeterminate. The word “indeterminate” means “not precisely determined or fixed.” Explain why this is probably a more appropriate way to describe $0 \div 0$.
16. (2 points) The counting-on addition strategy is sometimes used as a subtraction strategy. For example, to compute $7 - 5$, a child could start at 5 and count on to 7, keeping track of how much she counted.
- (a) Use this strategy to compute $13 - 8$.
- (b) This strategy relates addition and subtraction. What is the name of the model that is behind this strategy?
17. (3 points) Convert 1317 to base eight.

18. (2 points) List the first eight counting numbers in base three.
19. (3 points) Write and solve a division word problem in which the problem situation best fits the set partition model.
20. (3 points) Use any two of the three addition strategies that we studied to help a child master that fact that $7 + 8 = 15$.
21. (3 points) Use a rectangular array to expand and simplify $(x + 3)(x^2 + 3x + 4)$.

22. (1 point) Which one of the following is true?
- (a) dividend equals quotient times divisor plus remainder
 - (b) divisor equals quotient times dividend plus remainder
 - (c) dividend equals quotient times remainder plus divisor
 - (d) remainder equals dividend times divisor plus quotient
23. (1 point) Choose the addition model that best fits the following problem situation:
Mary has 7 crayons and Fred has 5 crayons. If Mary and Fred combine their crayons, how many will they have?
- (a) set model
 - (b) number line model
 - (c) combination model
 - (d) adding model
24. (1 point) When doing whole number addition, which of the following is another name for zero?
- (a) the multiplicative identity
 - (b) nothing
 - (c) the additive identity
 - (d) the subtrahend
25. (1 point) What is the value of the digit 6 in the base-ten numeral 1653?
- (a) 6
 - (b) 100
 - (c) 600
 - (d) 11
26. (1 point) Choose the multiplication model that best fits the following problem situation:
The desks in our room are arranged into a 5-by-7 rectangle. How many desks are there in our room?
- (a) area/array model
 - (b) missing minuend model
 - (c) repeated addition model
 - (d) Cartesian product model