

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Date: \_\_\_\_\_

### **2.1 and 2.2 Group Problem Solving**

- 1) In a given exercise, a universal set is not specified, but we know that actor Brad Pitt is a member of the universal set. Describe five different possible universal sets of which Brad Pitt is a member.
  - 1) \_\_\_\_\_
  - 2) \_\_\_\_\_
  - 3) \_\_\_\_\_
  - 4) \_\_\_\_\_
  - 5) \_\_\_\_\_
  
- 2) Which of the following is true?
  - a. Two sets can be equal but not equivalent. \_\_\_\_\_
  - b. Any set in roster notation that contains three dots must be infinite set. \_\_\_\_\_
  - c.  $n(\emptyset) = 1$  \_\_\_\_\_
  - d. Some sets that can be written in set-builder notation cannot be written in roster form. \_\_\_\_\_
  
- 3) Which one of the following is true?
  - a. The set of fractions between 0 and 1 is infinite set. \_\_\_\_\_
  - b. The set of multiples of 4 between 0 and 4,000,000,000 is an infinite set. \_\_\_\_\_
  - c. If the elements in a set cannot be counted in a trillion years, the set is an infinite set. \_\_\_\_\_
  - d. Because 0 is not a natural number, it can be deleted from any set without changing the set's cardinality. \_\_\_\_\_
  
- 4) Houses in Eclid Estates are all identical. However, a person can purchase a new house with some, all, or none of a set of options. This set includes {pool, screened-in balcony, lake view, alarm system, upgraded landscaping}. How many options are there for purchasing a house in this community?
  
  
  
  
  
  
  
  
  
  
- 5) A cheese pizza can be ordered with some, all, or none of the following set of toppings: {beef, ham, mushrooms, sausage, peppers, pepperoni, olives, prosciutto, onion}. How many different variations are available for ordering a pizza?

- 6) Based on more than 1500 ballots sent to film notables, the American Film Institute rated the top U.S. movies. The Institute selected *Citizen Kane* (1941), *Casablanca* (1942), *The Godfather* (1972), *Gone With the Wind* (1939), *Laurence of Arabia* (1962), and *The Wizard of Oz* (1939) as the top six films. Suppose that you have all six films on video and decide to view some, all, or none of these films. How many viewing options do you have?
- 7) A small town has four police cars. If a radio dispatcher receives a call, depending on the nature of the situation, no cars, one car, two cars, three cars, or all four cars can be sent. How many options does the dispatcher have for sending the police cars to the scene of the caller?
- 8) According to the U.S. Census Bureau, the most ethnically diverse U.S. cities are NYC, LA, Miami, Chicago, Washington D.C., Houston, San Diego, and Seattle. If you decided to visit some, all, or none of these cities how many travel options do you have?
- 9) Which of the following is true?
- The set  $\{3\}$  has  $2^3$ , or eight, subsets. \_\_\_\_\_
  - The complement of the complement of a set is the set itself \_\_\_\_\_
  - Every set has a proper subset \_\_\_\_\_
  - The set  $\{3, \{1, 4\}\}$  has eight subsets \_\_\_\_\_
- 10) Suppose that a nickel, a dime, and a quarter are on a table. You may select some, all, or none of the coins. Specify all of the different amounts of money that can be selected.

11) If a set has 127 proper subsets, how many elements are there in the set?

12) For set  $A = \{a, b, c, d\}$ ,

a. List all the subsets of set A

b. State which of the subsets in part (a) are not proper subsets of set A

13) A set contains nine elements.

a. How many subsets does it have?

b. How many proper subsets does it have?

14) If  $A \subset B$ , and  $B \subset C$ , must  $A \subset C$ ? Explain.

15) If  $A \subset C$ , and  $B \subseteq C$ , must  $A \subset C$ ? Explain.

16) If  $A \subseteq B$ , and  $B \subseteq C$ , must  $A \subset C$ ? Explain.