

You MUST use good notation and show appropriate work.

Math 102
(Section 1.6)

Name _____

1.6 Survey Problems

Use Venn diagrams to assist yourself in determining the number of elements (cardinality) of each of the following sets.

1. Assume set A contains 47 elements; set B contains 32 elements and set $A \cup B$ has 65 elements. How many elements are in each of the following sets?

a) $A \cap B$ _____

b) $A' \cap B$ _____

c) $A \cap B'$ _____

2. A certain store has 100 bikes for sale. 24 of these bikes are red and 32 are ten-speed. 8 of the ten-speed bikes are red. How many bikes are

(a) red or ten-speed? a) _____

(b) not red? b) _____

(c) red, but not ten-speed? c) _____

(d) not red or not ten-speed? d) _____

(e) neither red, nor ten-speed? e) _____

3. If $A = \{\emptyset\}$ and $B = \emptyset$ determine $n(A)$ and $n(B)$ $n(A) =$ _____

$n(B) =$ _____

4. Assume A , B , and C are subsets of a universal set U and $n(U) = 100$,
 $n(A \cap B \cap C) = 10$, $n(A \cap B) = 12$, $n(A \cap C) = 18$, $n(B \cap C) = 24$, $n(A) = 27$, $n(B) = 30$ and $n(C) = 40$.
 Determine each of the following cardinal numbers.

$$n(A \cup B) \underline{\hspace{2cm}}$$

$$n(A \cap B') \underline{\hspace{2cm}}$$

$$n((A \cap B) \cup C) = \underline{\hspace{2cm}}$$

$$n(A' \cap B' \cap C') = \underline{\hspace{2cm}}$$

5. In a survey of 80 people at a picnic, the following data were collected. 36 people drank lemonade; 33 people drank coffee; 31 people drank soda pop; 16 drank soda pop and coffee; 14 drank coffee and lemonade; everyone who drank both soda and lemonade also drank coffee, and only 5 people drank all three of these beverages. How many people

- a) did not drink any of the three mentioned beverages? _____
- b) did not drink coffee? _____
- c) drank only lemonade? _____
- d) drank coffee or soda pop? _____
- e) drank neither coffee nor lemonade? _____