

You MUST use good notation and show appropriate work.

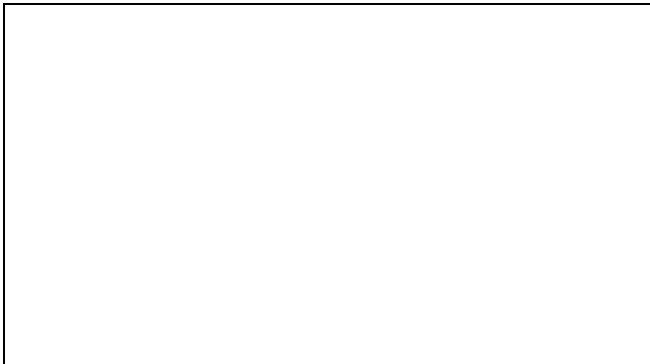
Math 102
(Section 2.4)

Name _____

2.4 Survey Problems & Additional Practice on Venn Diagrams

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?



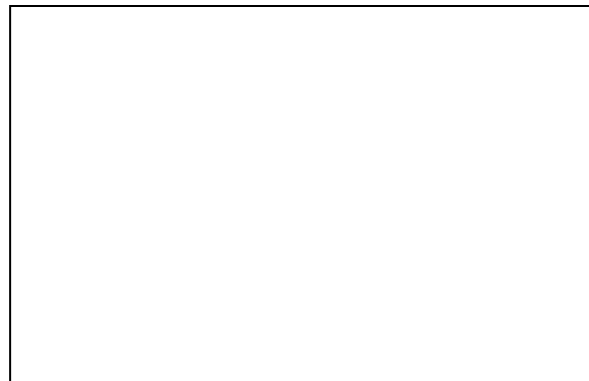
a) $A \cap B$ _____

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. Write each using set notation and determine 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) _____

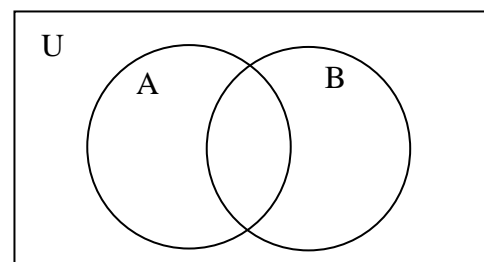
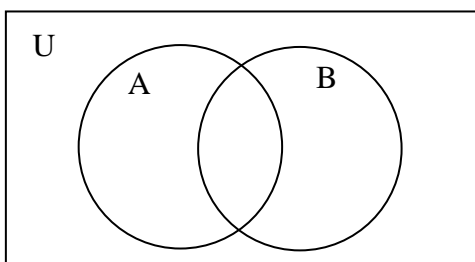
(e) neither red, nor ten-speed?

e) _____

3. In each Venn Diagram below, shade the region associated with the given set.

a) $(A \cup B') - A$

b) $A \cup (B \cup A)'$



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.



$n(A \cup B)$ _____

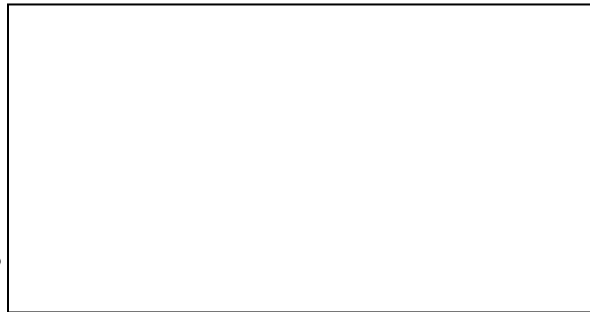
$n(A \cap B')$ _____

$n((A \cap B) \cup C) =$ _____

$n(A' \cap B' \cap C') =$ _____

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?



6. In each, name the shaded region using the letters A , B , C , and the set operations.

