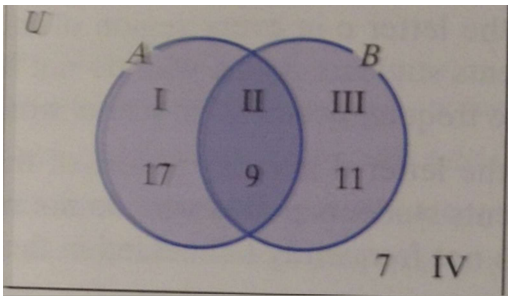
Prob/Stat/Discrete

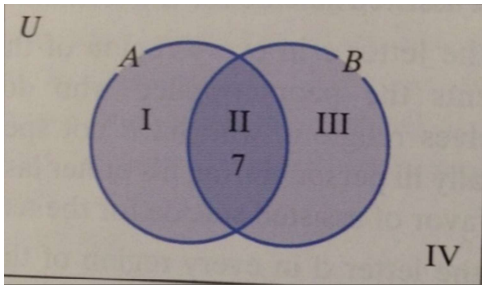
Homework 1.5 Name_____

Use the accompanying Venn diagram, which shows the number of elements in regions I through IV, to answer the question in exercises 1-4.



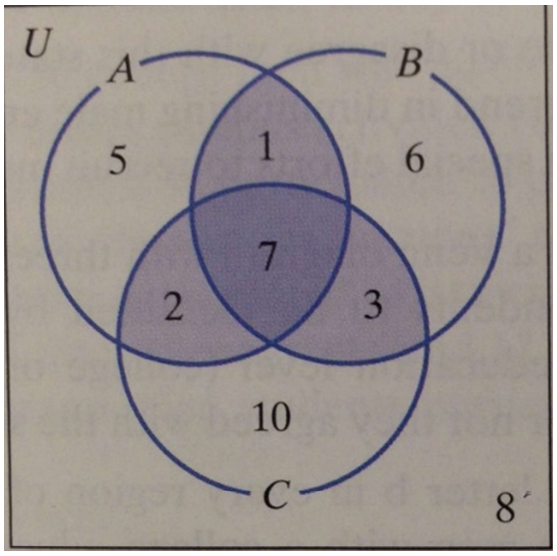
1. How many elements belong to set *B?*
2. How many elements belong to set *B* but not set *A?*
3. How many elements belong to set *A* or set *B?*
4. How many elements are there in the universal set?

Use the accompanying Venn diagram, which show the number of elements in region II, to answer Exercise 5.



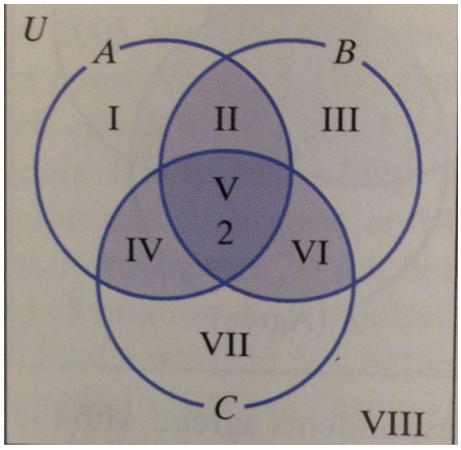
5. If $n(A) = 23$, $n(B) = 27$, and $n(U) = 53$, find the number of elements in each of regions I, III, and IV.

Use the accompanying Venn diagram, which shows the cardinality of each region, to answer Exercises 6-13.



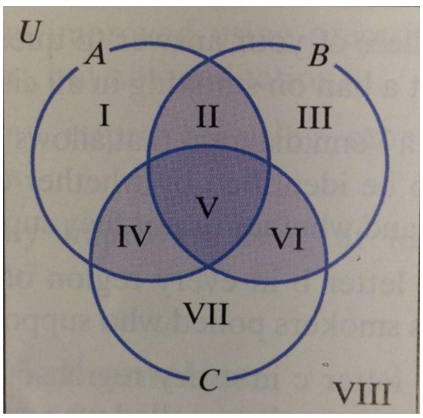
6. How many elements belong to set *A?*
7. How many elements belong to set *A* but not set *C?*
8. How many elements belong to set *A* or set *B?*
9. How many elements belong to set *A* and set *B?*
10. How many elements belong to set *A* and set *C,* but not to set *B?*
11. How many elements belong to set *A* or set *C*, but not to set *B?*
12. Considering sets *A, B,* and *C,* how many elements belong to exactly two of these sets?
13. Considering sets *A, B,* and *C,* how many elements belong to at least two of these sets?

This accompanying Venn diagram shows the number of elements in region V. In exercise 14, use the given cardinalities to determine the number of elements in each of the other seven regions.



14. $n(U) = 32$, $n(A) = 21$, $n(B) = 15$, $n(C) = 14$, $n(A \cap B) = 6$, $n(A \cap C) = 7$, $n(B \cap C) = 8$

In exercises 15-16 use the Venn diagram and the given conditions to determine the number of elements in each region, or explain why the conditions are impossible to meet.



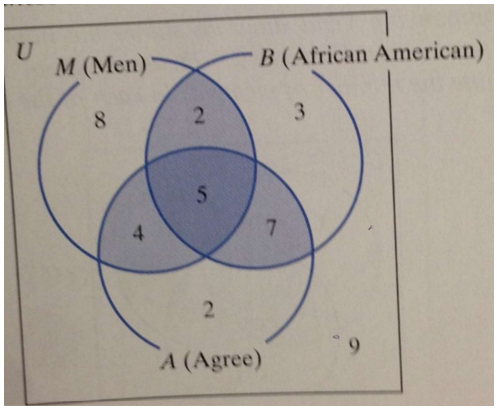
15. $n(U) = 42$, $n(A) = 26$, $n(B) = 22$, $n(C) = 25$, $n(A \cap B) = 17$, $n(A \cap C) = 11$, $n(B \cap C) = 9$, $n(A \cap B \cap C) = 5$
16. $n(U) = 25$, $n(A) = 8$, $n(B) = 9$, $n(C) = 10$, $n(A \cap B) = 6$, $n(A \cap C) = 9$, $n(B \cap C) = 8$, $n(A \cap B \cap C) = 5$

As discussed in the text on page 94, a poll asked respondents if they agreed with the statement

"Colleges should reserve a certain number of scholarships exclusively for minorities and women."

Hypothetical results of the poll are tabulated in the Venn diagram. Use these cardinalities to solve Exercises 17- 19.

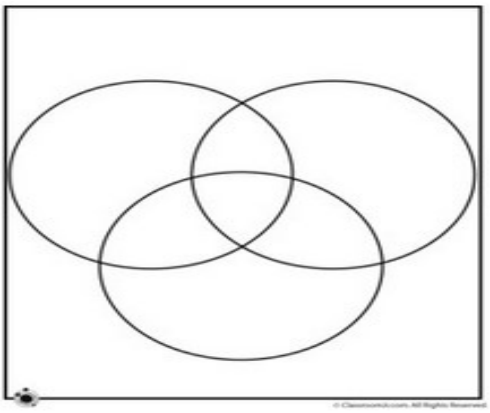
17. How many respondents disagreed with the statement?
18. How many people who are not African American agreed with the statement?
19. How many men who are not African American disagreed with the statement?



20. A poll asked respondents with the following question:

    Do you agree or disagree with the statement: In order to address the trend in diminishing male enrollment, colleges, should begin special efforts to recruit men?

    a) Construct a Venn diagram with three circles that allows the respondents to be identified by gender (man or women), education level (college or no college), and whether or not they agreed with the statement.



    b) Write the letter b in every region of the diagram that represents men with a college education who agreed with the statement.
    c) Write the letter c in every region of the diagram that represents women who disagreed with the statement.
    d) Write the letter d in every region of the diagram that represents women without a college education who agreed with the statement.
    e) Write the letter e in every region of the Venn diagram other than those in parts (b)-(d) and then describe who in the poll is represented by this region.

21. A survey of 180 college men was taken to determine participation in various campus activities. Forty-three students were in fraternities, 52 participated in campus sports, and 35 participated in various campus tutorial programs. Thirteen students participated in fraternities and campus sports, 14 in sports and tutorial programs, and 12 in fraternities and tutorial programs. Five students participated in all three activities. Of those surveyed.
    a) How many participated in only campus sports?
    b) How many participated in fraternities and sports, but not tutorial programs?
    c) How many participated in fraternities or sports, but not tutorial programs?
    d) How many participated in exactly one of these activities?
    e) How many participated in at least two of these activities?
    f) How many did not participate in any of the three activities?