

Part I: Multiple Choice. Write the correct answer in the space provided at the end of this section.

Suppose that $A = \{1, 3, 5, 7, 9\}$, $B = \{1, 3, 7\}$, and $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.
List the elements of the indicated set.

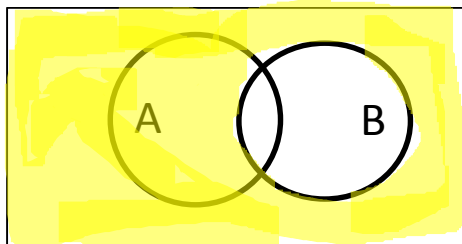
- 1) B' 1) $\{2, 4, 5, 6, 8, 9\}$
- 2) $A \cap B'$ $\{1, 3, 5, 7, 9\} \cap \{2, 4, 5, 6, 8, 9\}$ 2) $\{5, 9\}$
- 3) $A \cup A'$ 3) $\{u\}$

Suppose that $U = \{a, b, c, d, e\}$, $A = \{a, e\}$, $B = \{a, b\}$, and $C = \{a, b, c\}$.
List the elements of the indicated set.

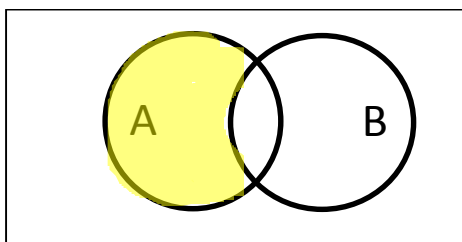
- 4) $A \cup B \cup C$ 4) $\{a, b, c, e\}$
- 5) $(A \cup B) \setminus C$ 5) $\{e\}$

Let $U = \{\text{all eligible voters in the Province}\}$, $A = \{\text{those who voted in the last election}\}$, $B = \{\text{those who voted Conservative in the last election}\}$, and $C = \{\text{voters under 30 years of age}\}$. Describe the indicated set.

- 6) $A \cap C$ 6) those under 30 and voted
- 7) $A' \cup C$ 7) those that didn't vote or those under 30
- 8) Find $n(S \cup T)$, given that $n(S) = 10$, $n(T) = 6$, and $n(S \cap T) = 5$. 8) $10 + 6 - 5 = 11$
- 9) Find $n(A \cup B)$ if $n(A) = 12$, $n(B) = 5$, and $n(A \cap B) = 3$. 9) $12 + 5 - 3 = 14$
- 10) In a survey of 1000 people who used media, it was found that 720 watched television news programs daily and 434 read a newspaper daily. How many of those surveyed used both media to receive news? 10) 154
- 11) In the following Venn diagram, shade the region corresponding to B' .



12) In the following Venn diagram, shade the region corresponding to $(A \cup B) \setminus B$.



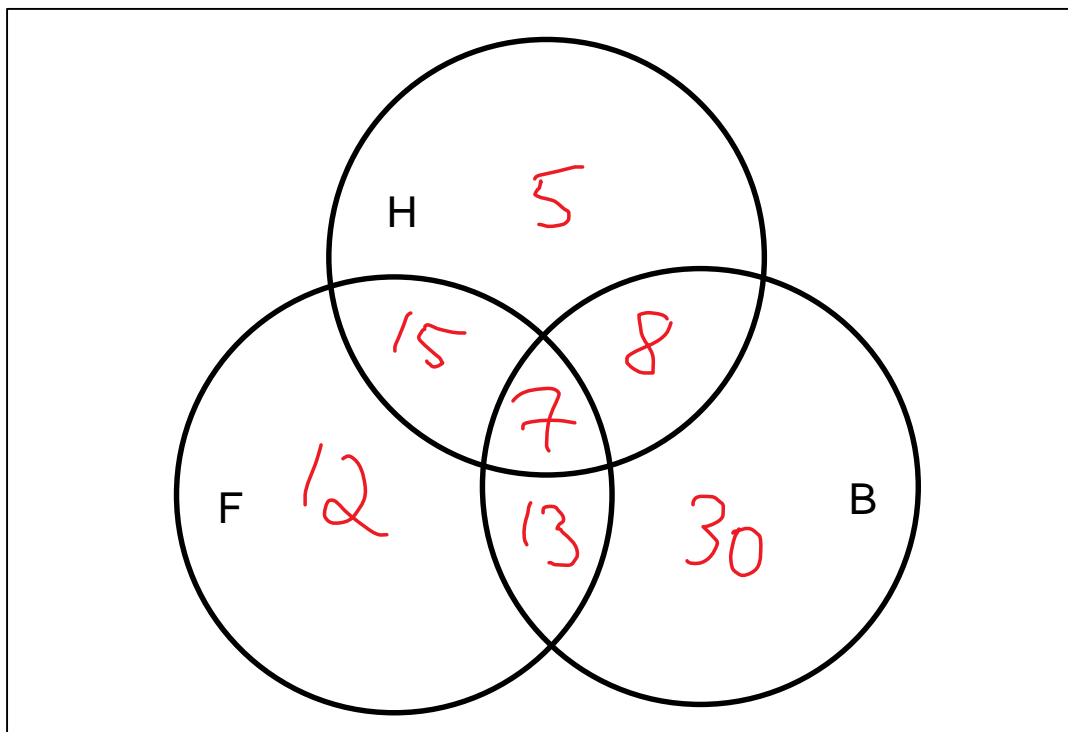
Part II:

LONG ANSWER

Instructions: Do all questions in the spaces provided. SHOW ALL WORKINGS as full credit may be given for incomplete or partially correct solutions. Correct answers without workings will not merit full marks.

Value

[3] 13) A survey was made of people who watched sports to determine the popularity of hockey, baseball and football. Of those surveyed, 35% watched hockey, 58% watched baseball, and 47% watched football. 15% watched hockey and baseball, 20% watched baseball and football, and 22% watched hockey and football. 7% watched all three sports. Complete the Venn diagram.

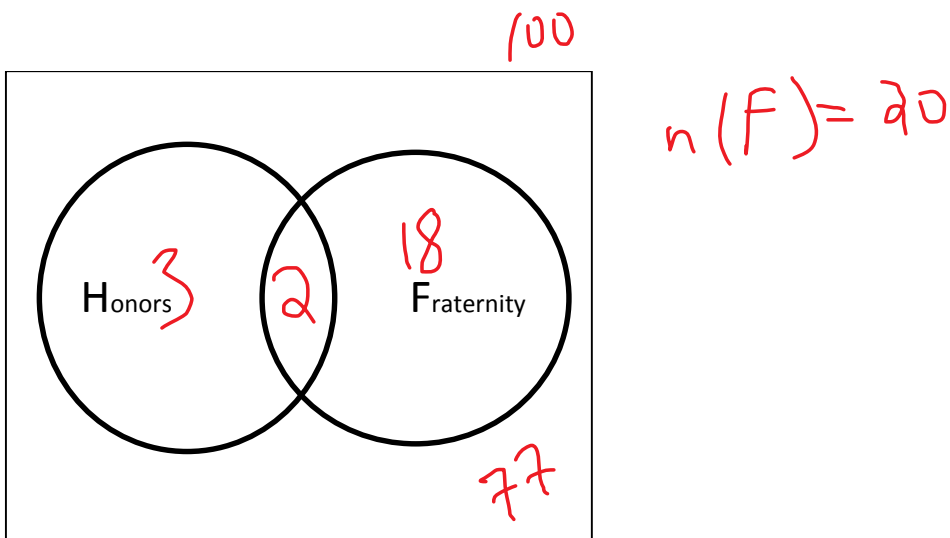


[2] What percentage watched hockey and football, but not baseball? 15

Value

- [2] 14) One hundred male college students were surveyed. Twenty of the students were members of a fraternity, 5 were honors students, 77 were neither members of a fraternity nor honors students, and 18 were members of a fraternity but not honors students.

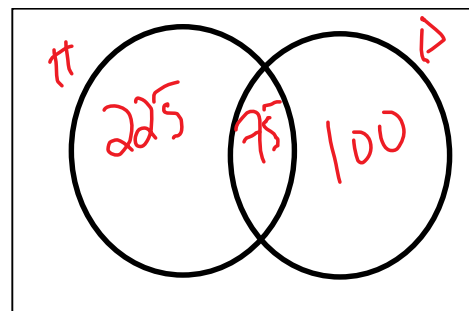
A) Complete the following Venn diagram displaying the given data and the number of elements in each region.



- [2] B) How many honors students do not belong to a fraternity? 3

- [2] C) How many fraternity members are honors students? 2

- 15) A certain clinic has 400 patients, each of whom is being treated for heart disease or diabetes. Suppose that 300 are treated for heart disease and 75 are treated for heart disease and diabetes.



- [2] A) How many patients are treated for diabetes? 175

- [2] B) How many patients are treated only for heart disease? 225

Value

- [5] 16) There are twenty-five dogs at a dog show.
- Twelve of the dogs are black.
 - Eight of the dogs have short tails.
 - Fifteen of the dogs have long hair.
 - There is only one dog that is black with a short tail and long hair.
 - Three of the dogs are black with short tails and do not have long hair.
 - Two of the dogs have short tails and long hair but are not black.
 - All of the dogs at the dog show have at least one of the mentioned characteristics.

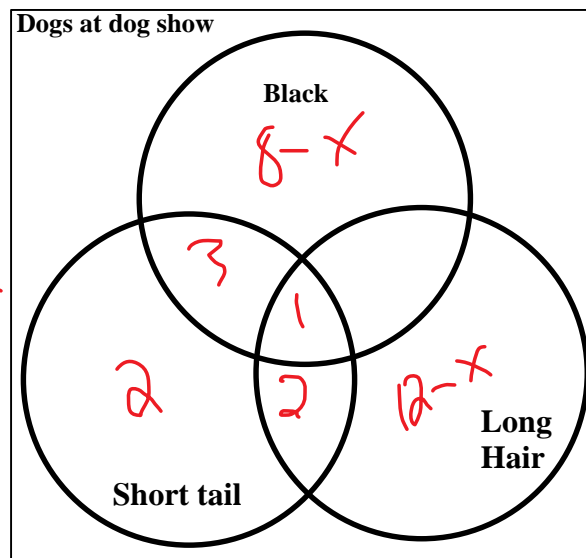
Complete the following Venn diagram to determine how many of the dogs are black with long hair but do not have short tails.

$$25 = 8 - x + 3 + 1 + x + 2 + 2 + 12 - x$$

$$25 = 28 - x$$

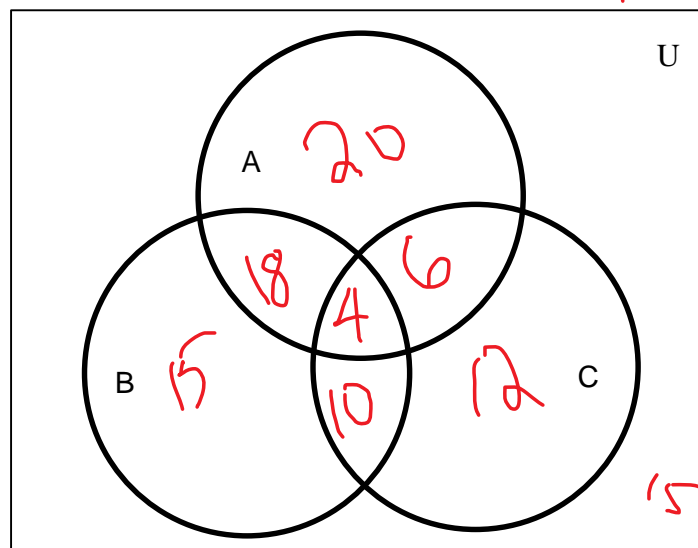
$$x = 28 - 25$$

$$x = 3$$



- 17) Let $n(U) = 100$, $n(A) = 48$, $n(B) = 47$, $n(C) = 32$, $n(A \cap B) = 22$, $n(A \cap C) = 10$, $n(B \cap C) = 14$, and $n(A \cap B \cap C) = 4$.

- [3] A) Draw a Venn diagram displaying the given data and the number of elements in each basic region.



- [2] B) Determine $n(A \cap B \setminus C)$. 18

- [2] C) Determine $n[(A \cup B)']$. 12 + 15 = 27