

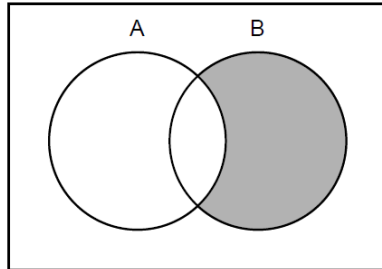
**Section A: Multiple Choice.** Select the most appropriate answer and place in the blank provided. (20%)

1. Given  $A = \{1, 3, 6, 8, 9, 12, 15\}$  and  $B = \{6, 9, 12\}$ , which is TRUE? 1. \_\_\_

- A) B is the complement of A
- B)  $A \cup B = \emptyset$
- C) A and B are disjoint sets
- D)  $B \subset A$

2. Describe the shaded region: 2. \_\_\_

- A) B
- B)  $B'$
- C)  $A'$
- D)  $B \setminus A$



3. Given  $A = \{-9, -8, -7, 0\}$ , what is the value of  $n(A)$ ? = 4 3. \_\_\_

- A) 1
- B) 4
- C) 9
- D) 10

4. If  $A = \{0, 2, 3, 4, 9, 11\}$  and  $B = \{2, 3, 6, 8, 9, 10\}$  what is  $A \setminus B$ ? 4. \_\_\_

- A)  $\{0, 2, 3, 4, 8, 9, 10, 11\}$
- B)  $\{0, 4, 11\}$
- C)  $\{2, 3, 9\}$
- D)  $\{6, 8, 10\}$

$12 + 8 = 20 - 4 = 16$

Consider the following two sets for 5 and 6.

- $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
- $B = \{-9, -6, -3, 0, 3, 6, 9, 12\}$

5. Determine  $n(A \cup B)$ . 5. \_\_\_

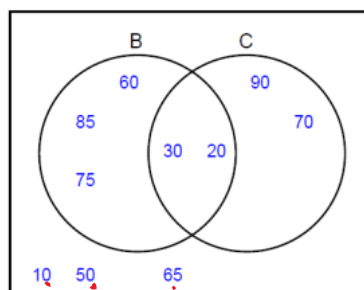
- A) 8
- B) 11
- C) 16
- D) 20

6. Determine  $A \cap B$ . 6. \_\_\_

- A)  $\{3, 6, 9, 12\}$
- B)  $\{0, 3, 6, 9, 12\}$
- C)  $\{1, 2, 4, 5, 7, 8, 10, 11\}$
- D)  $\{-9, -6, 6, 9\}$

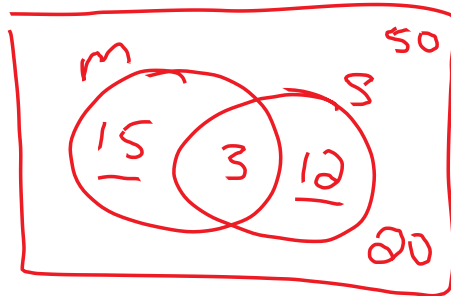
7. What is  $(B \cup C)'$ ? 7. \_\_\_

- A)  $\{20, 30\}$
- B)  $\{10, 50, 65\}$
- C)  $\{10, 50, 65, 60, 70, 75, 85, 90\}$
- D)  $\{20, 30, 60, 70, 75, 85, 90\}$



8. Carlos surveyed 50 students about their favourite subjects in school. He found that 18 students liked mathematics, 15 students liked science, and 20 students liked neither mathematics nor science. How many students like only one subject? 8.\_\_\_\_

- (A) 12
- (B) 15
- (C) 27
- (D) 33



$$A \cup B = 50 - 20 = 30$$

$$A + B = 18 + 15 = 33$$

$$33 - 30 = 3$$

$$15 + 12 = 27$$

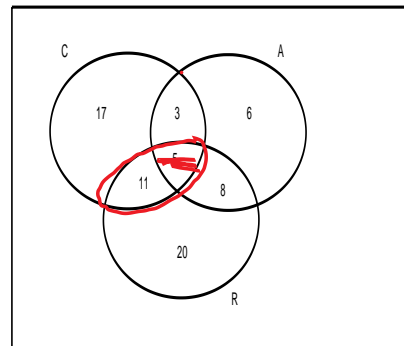
9. If Set  $A = \{-2, 0, 2, 4, 6, 8, 10\}$ , which represents set notation? 9.\_\_\_\_

- A)  $A = 2x, \{x|x \in R\}$
- B)  $A = 2x, \{x|-1 \leq x \leq 5, x \in W\}$
- C)  $A = 2x, \{x|-1 \leq x \leq 5, x \in N\}$
- (D)  $A = 2x, \{x|-1 \leq x \leq 5, x \in I\}$

-1, 0, 1, 2, 3, 4, 5

10. A summer camp offers canoeing, rock climbing, and archery. The following Venn diagram shows the types of activities the campers like. Determine  $n((R \cap C) \setminus A)$ ? 10.\_\_\_\_

- (A) 5
- (B) 11
- (C) 16
- (D) 26



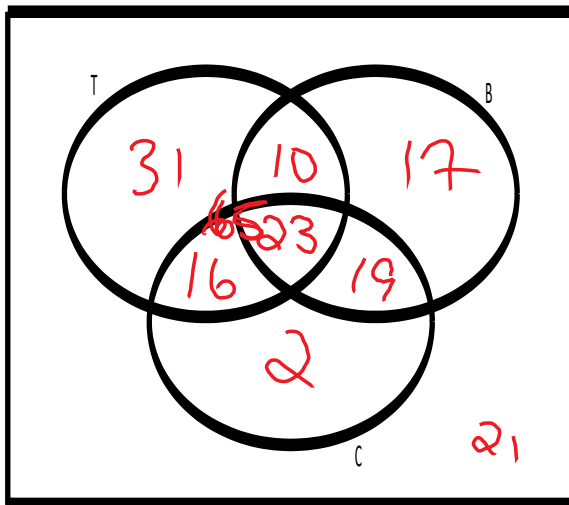
**Section B: Constructed Response.** Answer all questions and show all workings for full marks.

1. The Lettuce Romaine Friends Club, which consists of people from the Bay Robert's area who have small vegetable gardens, obtained the following information from its members:

- 80 grew tomatoes
- 69 grew green beans
- 60 grew carrots
- 23 grew all three
- 42 grew carrots and beans
- 39 grew tomatoes and carrots
- 33 grew tomatoes and beans
- 21 grew neither tomatoes nor carrots nor beans.

A) Illustrate the given information on a Venn diagram.

(4%)



B) How many members are in the club?

(1%)

$$31 + 10 + 17 + 16 + 23 + 19 + 2 + 21 = 139$$

C) How many grew carrots or beans but not tomatoes?

(1%)

$$2 + 19 + 17 = 38$$

D) How many grew tomatoes or beans?

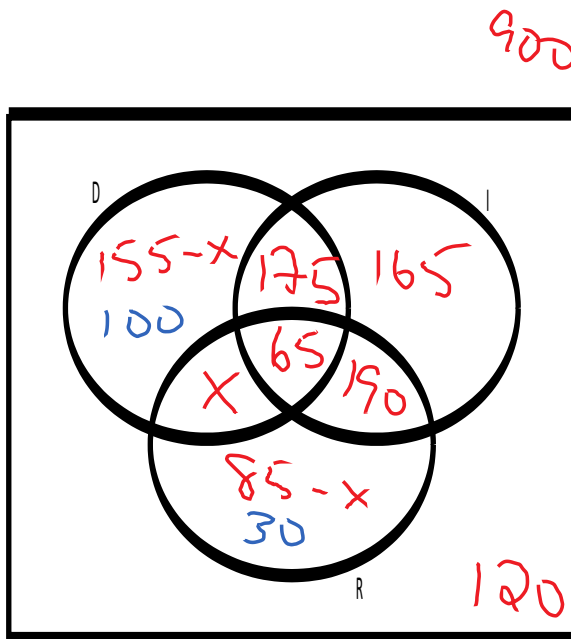
(1%)

$$116$$

2. NTV television station sent out questionnaires to determine if viewers would rather see a documentary, an interview show or reruns of a game show. There were 900 responses with the following results:

- 395 were interested in a documentary.
- 595 were interested in an interview show.
- 340 were interested in reruns.
- 65 were interested in all three.
- 175 were interested in documentaries and interview shows but not reruns.
- 190 were interested in interview shows and reruns but not documentaries.
- 120 were interested in none of the three.

How many are interested in exactly one kind of show? Use the Venn Diagram to find your answer. (8%)



$$100 + 165 + 30 = 295$$

$$155 - x + 175 + 165 + 65 + x + 190 + 85 - x + 120 = 900$$

$$955 - x = 900$$

$$955 - 900 = x$$

$$x = 55$$

3. A survey of 120 first graders was conducted concerning the types of animals that were in the last book each of them read. The following results were obtained:

48 read about an elephant

56 read about a monkey

44 read about a tiger

7 read about an elephant and a tiger but not a monkey

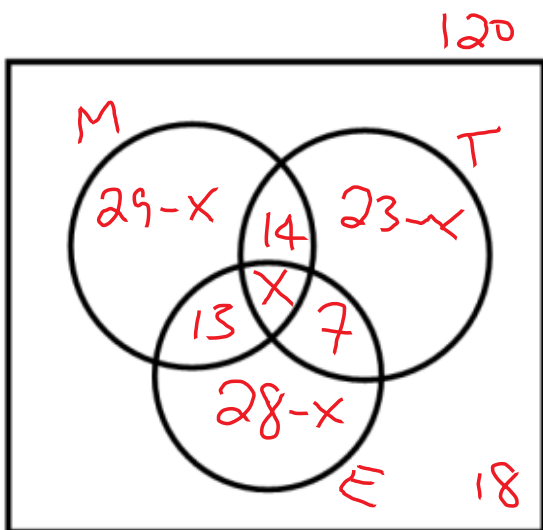
13 read about an elephant and a monkey but not a tiger

14 read about a monkey and a tiger but not an elephant

18 did not read about any of these animals.

How many students read a book about all three animals?

(8%)



$$29 - x + 14 + 23 - x + x + 13 + 7 + 28 - x + 18 = 120$$

$$132 - 2x = 120$$

$$132 - 120 = 2x$$

$$\frac{12}{2} = \frac{2x}{2}$$

$$x = 6$$