

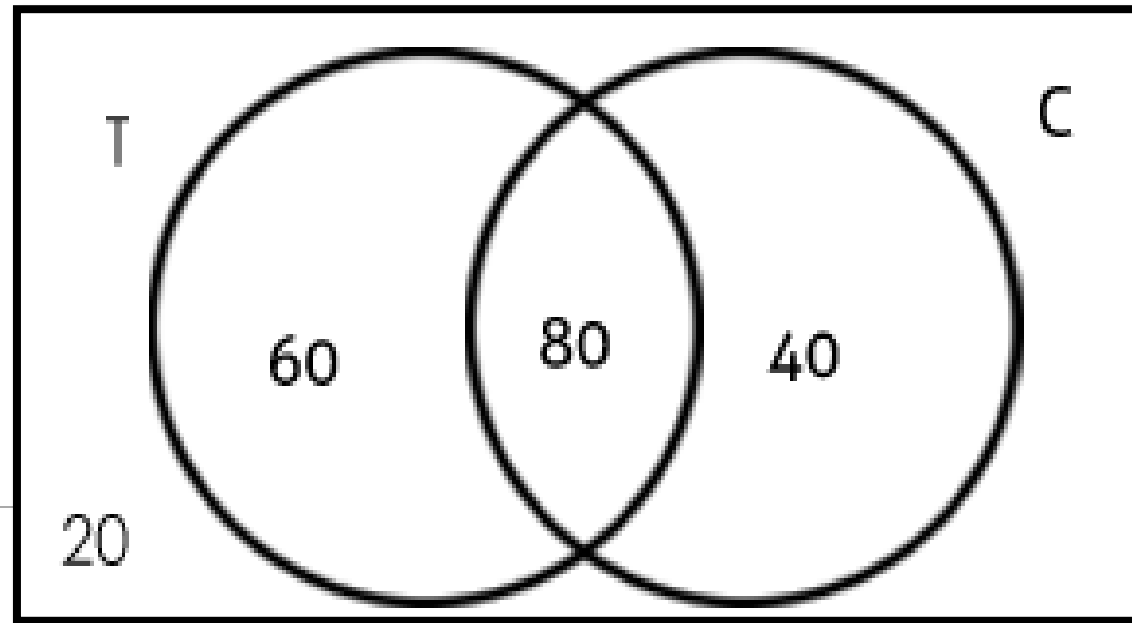
Venn Diagram (VD)

A. Draw the VD of the given statement,

In NU MNL 200 students are randomly selected to determine if they like coffee, tea or both. 140 like tea, 120 like coffee and 80 like both tea and coffee.

1. How many students like tea or coffee?
2. How many students like tea and coffee?
3. How many students like at least one of the beverages?
4. How many students like at most one of the beverages?

Venn Diagram (VD)



1. ANSWER: 180

SOLUTION:

Given:

- 140 students like **tea**.
- 120 students like **coffee**.
- 80 students like **both tea and coffee**.

We need to calculate the total number of students who like **either tea or coffee** (i.e., the union of the two sets).

This is represented by: $|T \cup C| = |T| + |C| - |T \cap C|$

Where:

- $|T|$ is the number of students who like tea.
- $|C|$ is the number of students who like coffee.
- $|T \cap C|$ is the number of students who like both tea and coffee.

Substituting the given values:

$|T \cup C| = 140 + 120 - 80 = 180$ Thus, **180 students** like tea or coffee (or both).

Explanation:

- We add the students who like tea and the students who like coffee.
- We subtract the number of students who like both to avoid double-counting them.

2. ANSWER: 80

SOLUTION:

Given:

- T be the set of students who like tea.
- C be the set of students who like coffee.

The total number of students who like either tea or coffee or both is given by:

$$|T \cup C| = |T| + |C| - |T \cap C|$$

Where:

- $|T \cup C|$ is the total number of students who like either tea or coffee or both,
 - $|T| = 140$ is the number of students who like tea,
 - $|C| = 120$ is the number of students who like coffee,
 - $|T \cap C| = 80$ is the number of students who like both.
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Plugging in the values:

$$|T \cup C| = 140 + 120 - 80 = 180$$

So, 180 students like either tea or coffee or both, confirming that the 80 students who like both is correct.

3. ANSWER: 180

SOLUTION:

Given:

- 140 students like tea.
- 120 students like coffee.
- 80 students like both tea and coffee.

The formula for finding the number of students who like at least one of the beverages is:

$$|T \cup C| = |T| + |C| - |T \cap C|$$

Where:

- $|T \cup C|$ is the number of students who like at least one of the beverages.
 - $|T|=140$ is the number of students who like tea.
 - $|C|=120$ is the number of students who like coffee.
 - $|T \cap C|=80$ is the number of students who like both tea and coffee.
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Substituting the values:

$$|T \cup C| = 140 + 120 - 80 = 180$$

Thus, **180 students** like at least one of the beverages (either tea, coffee, or both).

4. ANSWER: 100

SOLUTION:

To find how many students like **at most one** of the beverages (either tea or coffee, but not both), we need to calculate the number of students who like **only tea** or **only coffee**.

Step 1: Calculate students who like only tea and only coffee

- Students who like **only tea** are those who like tea but not coffee. This can be calculated by subtracting the number of students who like both tea and coffee from the total number of students who like tea:

- Only Tea = $|T| - |T \cap C| = 140 - 80 = 60$

Students who like **only coffee** are those who like coffee but not tea.

This can be calculated by subtracting the number of students who like both tea and coffee from the total number of students who like coffee:

- Only Coffee = $|C| - |T \cap C| = 120 - 80 = 40$

Step 2: Calculate the total number of students who like at most one beverage

Students who like at most one beverage are those who like either **only tea** or **only coffee**.

So, the total number is the sum of students who like only tea and students who like only coffee:

At most one beverage = Only Tea + Only Coffee = $60 + 40 = 100$

Final Answer:

100 students like at most one of the beverages (either tea or coffee, but not both).

End of example
