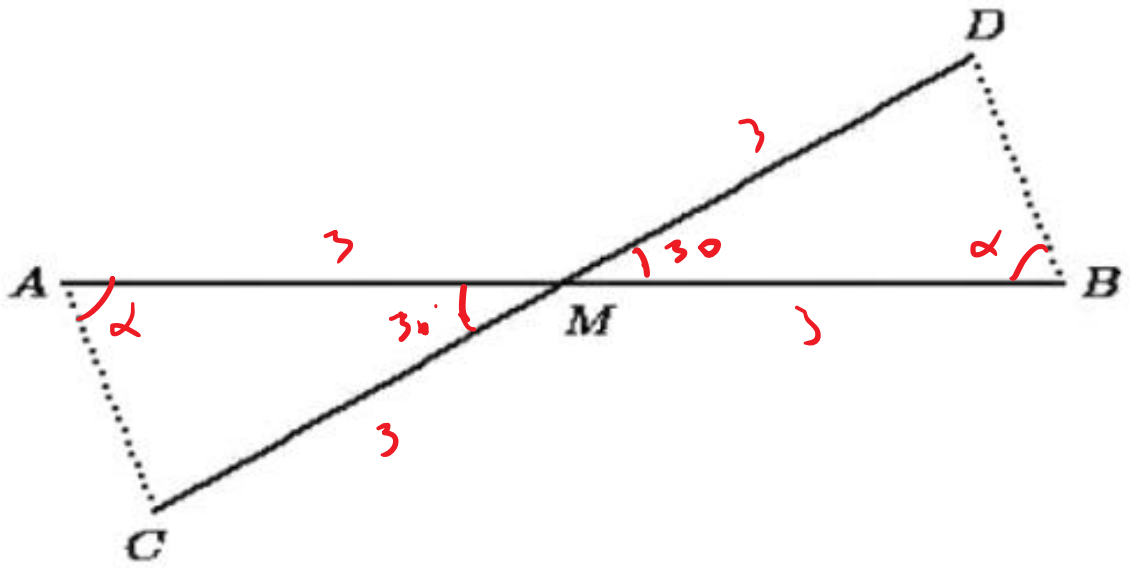
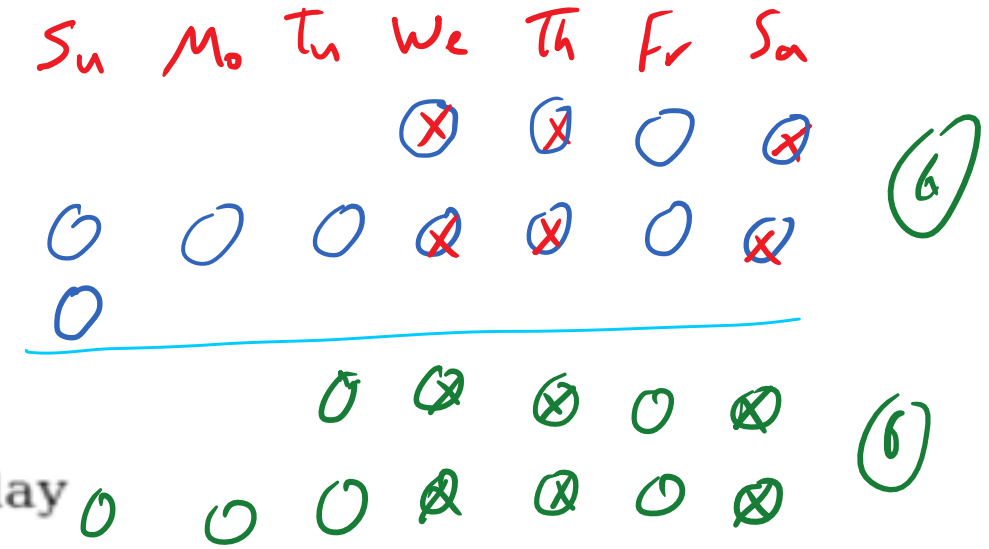
Two coplanar segments $\overline{AB}$ and $\overline{CD}$ meet at point M. In order that the segments $\overline{AC}$ and $\overline{DB}$ be parallel



- A. it is necessary and sufficient that $\overline{AM} = \overline{CM}$
- B. it is sufficient that $\overline{AM} = \overline{MB}$
- C. it is necessary that $\overline{AM} = \overline{MB}$
- D. it is necessary that $\overline{AM} = \overline{MB}$ and $\overline{CM} = \overline{MD}$
- ✓ E. it is sufficient that $\overline{AM} = \overline{MB}$ and $\overline{CM} = \overline{MD}$

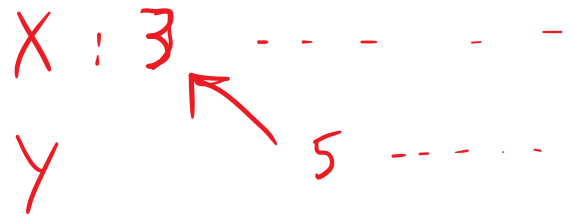
I will vacation for 12 days (include the arrival day) in a strange place where the sun shines only on Wednesdays, Thursdays and Saturdays. To get the maximum number of sunny days, I must arrive

- A. either Wednesday or Thursday
- B. Wednesday
- ✓ C. either Tuesday or Wednesday
- D. Saturday
- E. either Wednesday, Thursday or Saturday



Let X and Y be two subsets of the real numbers. We know that 3 is the minimum of X and that 5 is the minimum of Y Then necessarily

- A. there exist infinitely many elements of X between 3 and 5
- B. all the elements of X are less than 5
- C. there exists at least one element of X greater than 5
- D. all the elements of X are less than any element of Y
- ✓ E. there exists at least one element of X less than 5



A farmer grows only 5 types of vegetables: oats, corn, barley, peas, and soy. Every year she plants only 3 types of vegetables, according to the following rule:

1. if she plants barley one year, she does not replant it the next
2. every year she plants corn, she also plants oats
3. every year she plants at most one of the vegetables she planted the year before

Which of the following answers shows two possible triplets of vegetables that she can plant in two consecutive years (the earlier year first)?

- A. Oats, peas, soy; corn, oats, barley
- B. Peas, corn, soy; oats, peas, barley
- C. Oats, corn, peas; corn, oats, soy
- D. Soy, peas, barley; maize, oats, barley
- E. Oats, corn, barley; corn, peas, soy

Naples and Capua are both cities in Campania. If Asdrubale were born in Naples, then he would be a Campanian. However, we discovered that Asdrubale was not born in Naples. With only this information available, which of the following statements can we deduce?

- A. We cannot say whether Asdrubale is Campanian or not
- B. Asdrubale is Italian
- C. Asdrubale is not Campanian
- D. Asdrubale is a Campanian
- E. Asdrubale was born in Capua

اظہار الشن

Asserting that

Every 24-hour pharmacy must always have at least one pharmacist on duty

is equivalent to saying that

A. in Liola 's pharmacy the pharmacists go to lunch from noon to 1am

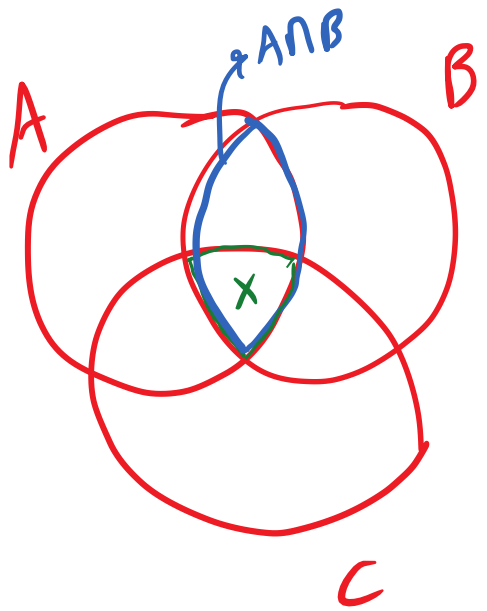
B. there are no 24-hour pharmacies at which there is not always at least one pharmacist on duty

C. in every pharmacy the same pharmacist is on duty 24 hours a day

D. at a 24-hour pharmacy there are never two pharmacists on duty simultaneously

E. there is one 24-hour pharmacy at which there is not always one pharmacist on duty

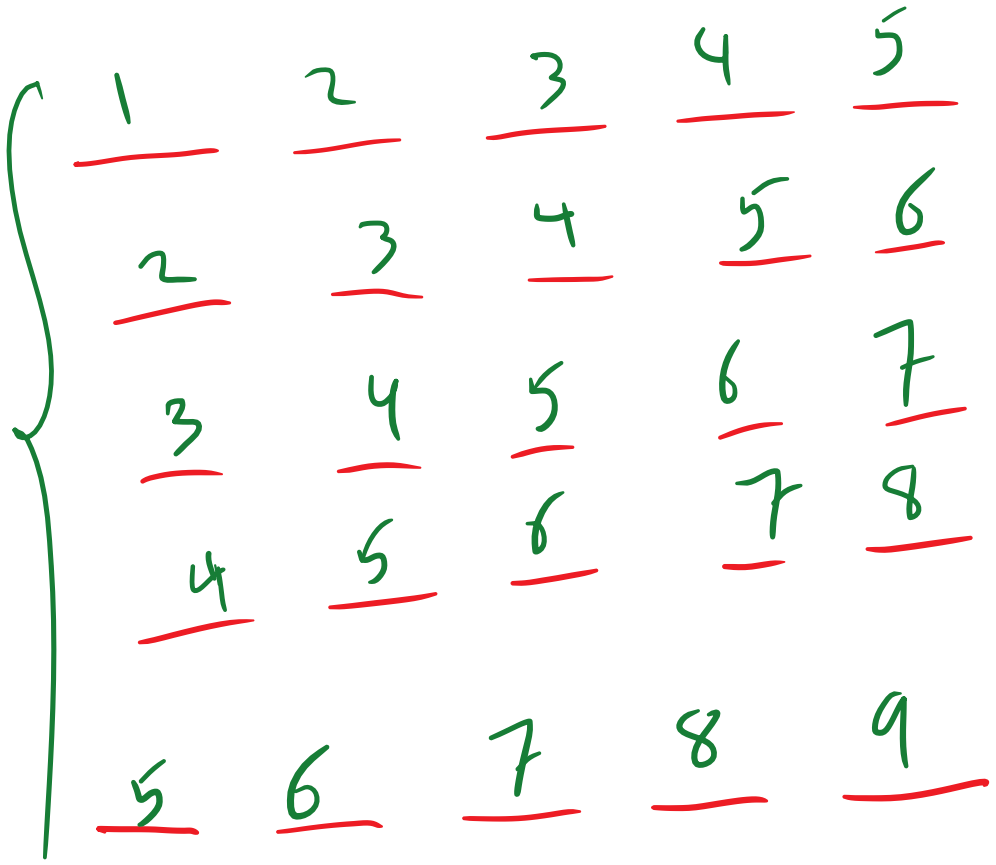
Let A, B and C be three sets and suppose there is an element belonging to $A \cap B \cap C$. Then it's necessarily true that



- A. $A \cap B$ is strictly contained in $A \cap B \cap C$
- B. $A \cap B \cap C$ is strictly contained in $A \cap B$
- C. $A \cup B \cup C$ is contained in $A \cup B$
- D. there is an element that is in $A \cap B$ but not in C
- ✓ E. $A \cap B$ is not the empty set

In decimal notation, how many five digit natural numbers (reading from left to right) are such that each digit but the first is the previous incremented by 1?

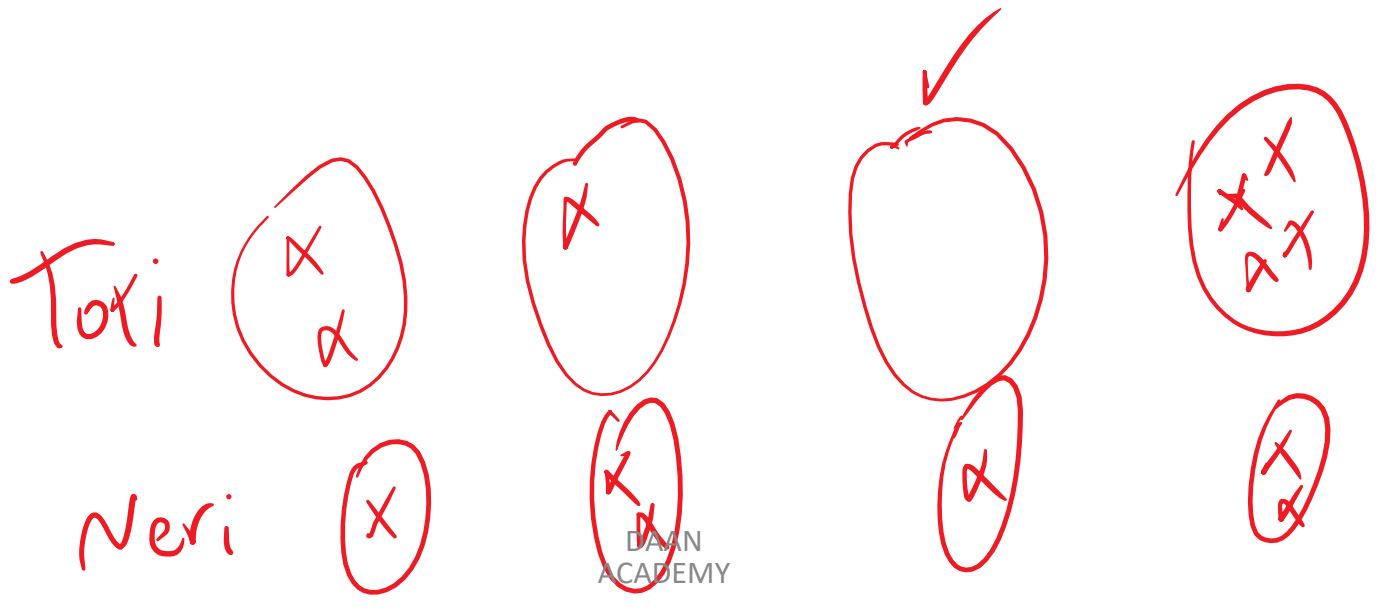
- A. 25
- B. 6
- C. 120
- ✓ D. 5
- E. 5^5



At the high school 'Toti Benben' in 2001, there was at least one class in which all the students passed their matriculation exam. This did not happen in the high school 'Neri di Jella'. It follows necessarily that, by the end of the 2001 school year,

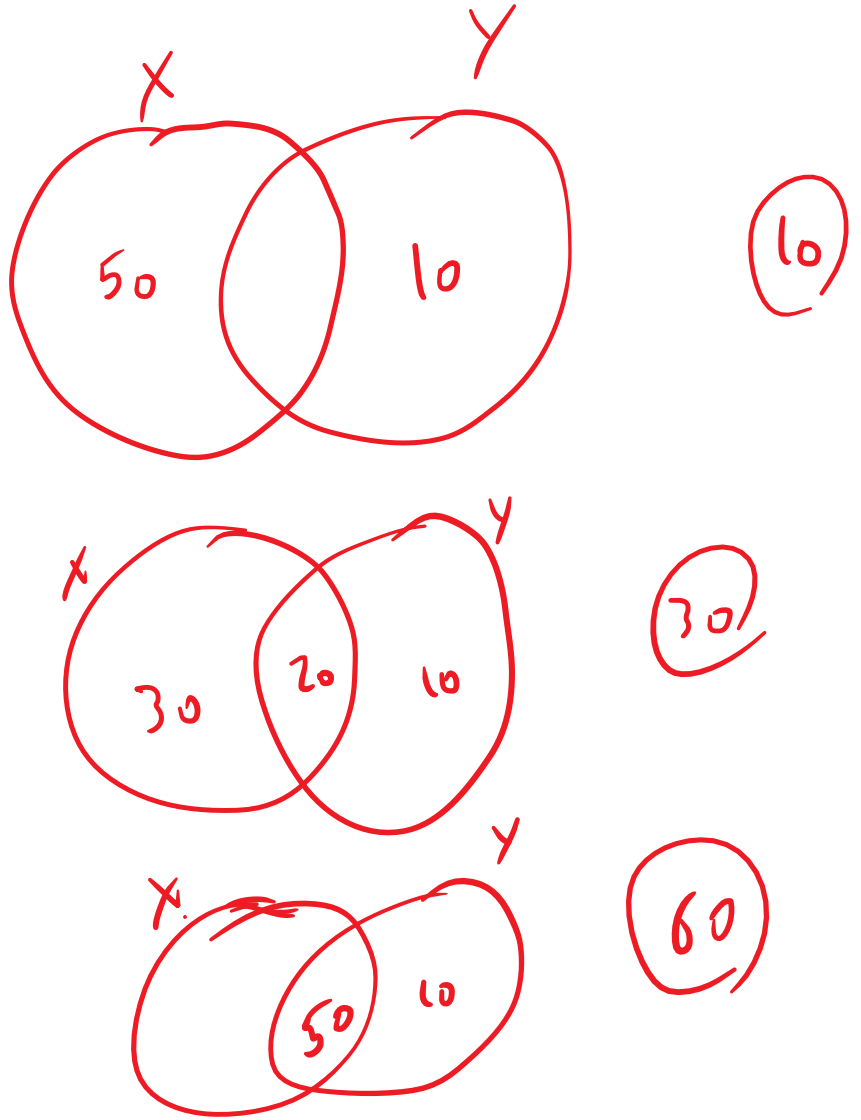
افتان

- A. at the high school "Neri di Jella" there was at least one class in which all the students flunked
- B. at the high school "Neri di Jella" nobody passed the matriculation exam in any class
- C. at the high school "Toti Benben" at least one person graduated in each class
- D. at the high school "Toti Benben" there was at least one class in which all the students flunked
- ✓ E. at the high school "Neri di Jella" each class had a student who flunked



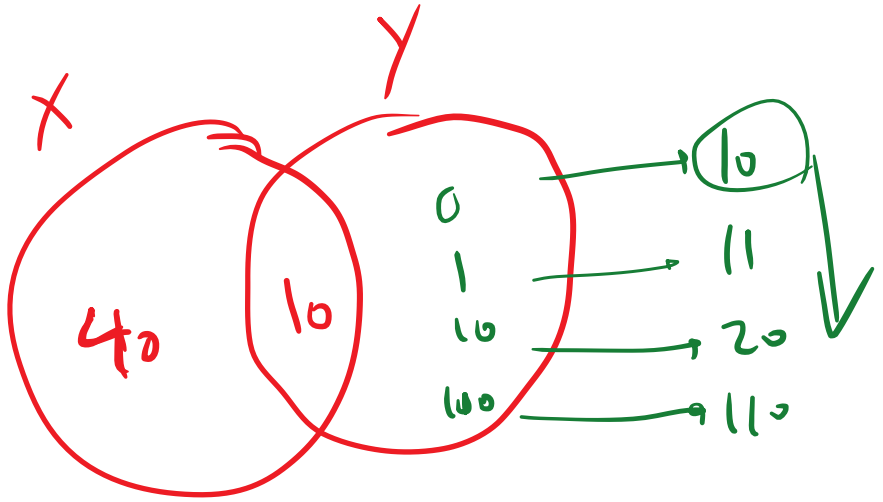
If X and Y are two sets with X containing 50 elements and $X \cup Y$ containing 60 elements, then the number of elements of Y

- A. is 60
- B. is 110
- C. is more than 60
- ✓ D. is at least 10 and at most 60
- E. is 10



If X and Y are two sets with X containing 50 elements and $X \cap Y$ containing 10 elements, then the number of elements of Y

- A. is at least 10
- B. is at least 10 and at most 60
- C. is 10
- D. is 60
- E. is greater than 60



Saying that it's false that

no man has one name only

is equivalent to saying that

معادل

- A. at least one man has two names
- B. there exists a man named Mario
- ✓ C. there exists at least one man with one name only
- D. there exists a man without name
- E. all men have only one name

Consider the statement,

No dog has three paws. ⟶ هیچ سگی سه پنجه ندارد

Saying that it is false means that

- A. all dogs have four paws
- ✓ B. at least one dog has three paws
- C. at least one dog has a number of paws different from three
- D. all dogs have three paws
- E. all dogs have a number of paws different from three

The statement *Each time I took my umbrella, it did not rain* is false. Then it is true that

- A. when I went out with my umbrella, it rained
- B. every day it did not rain, I went out with my umbrella
- C. every day I went out without my umbrella, it rained
- D. at least one time I went out with my umbrella and it rained
- E. if it rained, then I did not have my umbrella

The negation of the statement

Each student who studies passes the exam

is

- A. Some students who do not pass the exam have studied
- B. There are students who pass the exam without having studied
- C. Whoever does not study will fail
- D. There are students who do not study and do not pass the exam
- E. All those who study pass the exam

$\sim(p \wedge q) \equiv (\sim p) \vee (\sim q)$

$\sim(p \vee q) \equiv (\sim p) \wedge (\sim q)$

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The statement

It's not true that it is rainy and windy

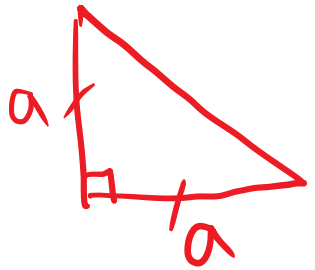
means that

- A. it is not rainy or it is not windy
- B. it is rainy and it is not windy
- C. it is not rainy and it is not windy
- D. it is not rainy and it is windy
- E. today it is expected to be rainy and windy

Let T be a triangle. Then the negation of the statement

T is a right isosceles triangle

is:



- A. T is a right triangle but is not isosceles.
- B. T is isosceles but not a right triangle.
- C. T is not a right triangle and it is not isosceles.
- D. T is not a right triangle or it is not isosceles.
- E. T is not a triangle.

Three friends own three sailboats, the Sprint, the Turtle and the Rabbit. They raced and then told us "Rabbit finished before Sprint" and "Rabbit finished before Turtle".
Given that at least one of these two statements is true, we can deduce that

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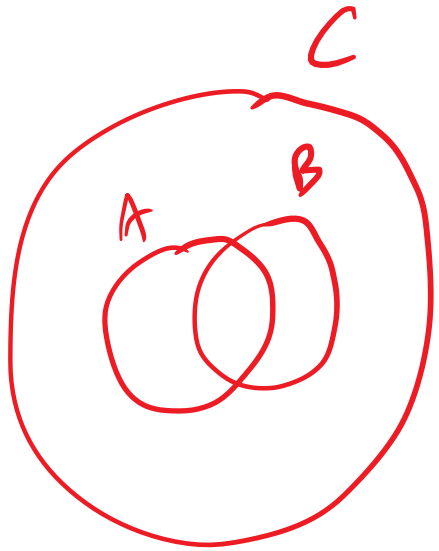
- A. Turtle finished last
- B. Turtle finished before Sprint
- C. Rabbit finished first
- D. Turtle finished second
- ✓ E. Rabbit did not finish last

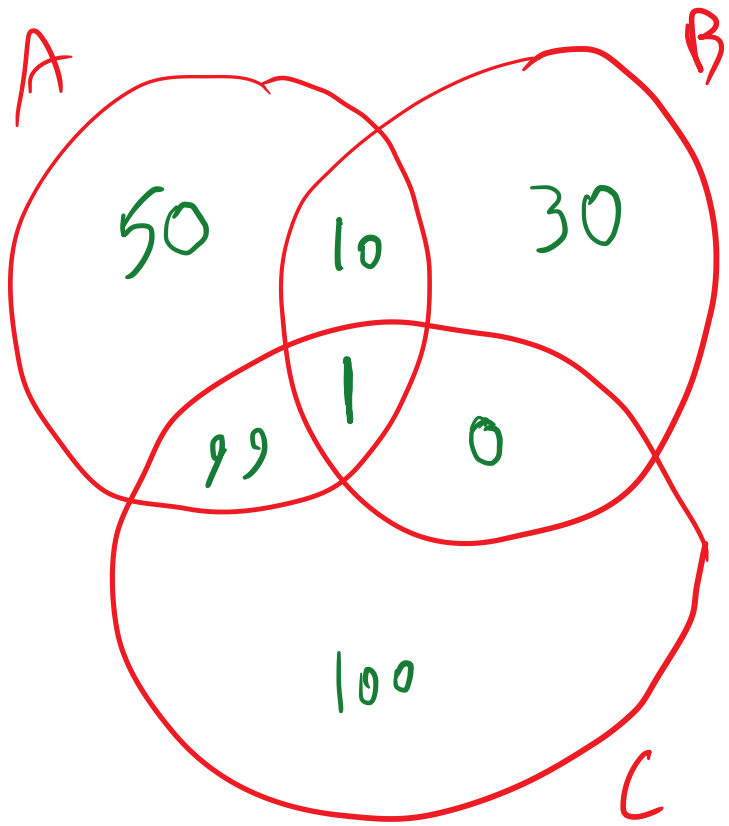
Let A, B and C be three sets such that $A \cup B$ is contained in C. Then it is necessarily true that

- A. $A \cup B \cup C = A \cup B$
- B. $A \cap C = B \cap C$
- C. $A \neq B$
- ✓ D. $A \cup B \cup C = C$
- E. $A = B$



The 290 residents of Clearcut Forest are divided into three branches, Ash, Bubinga and Cocobolo. Only one resident, the mayor, belongs to all three branches. Fifty residents belong only to the Ashes, thirty only to the Bubingas, and 100 only to the Cocobolos. The Cocobolo branch has 200 members total, and none of these members (except the mayor) also belong to the Bubingas.
How many belong to the Ash branch?

- A. 250
- B. 149
- C. 150
- D. 230
- ✓ E. 160



'Sensei Rinzai, is it perhaps true that everything in life is contradictory?', asked young Hakurakuten to his spiritual guide. 'He is not wise to ask, if he raises only questions he does not know the answer to,' said the old Rinzai. Not satisfied by these words, young Hakurakuten asked again: 'Explain to me, sensei: is everything in life a contradiction?' 'Who is wise and knows the answer to a question does not ask,' murmured the sensei, before falling asleep. Then young Hakurakuten, illuminated by the truth that he had heard, said, reasoning correctly:

A. the wise do not ask questions; therefore I am not wise

B. everything in life is a contradiction

C. Sensei Rinzai is not wise

D. the lotus flower grows under the snow-bent tree

E. Sensei Rinzai is wise