Question 1

A deck of 300 cards is numbered with whole numbers from 1 to 300, with each card having just one number. How many of these cards do not have a 4 printed on them?

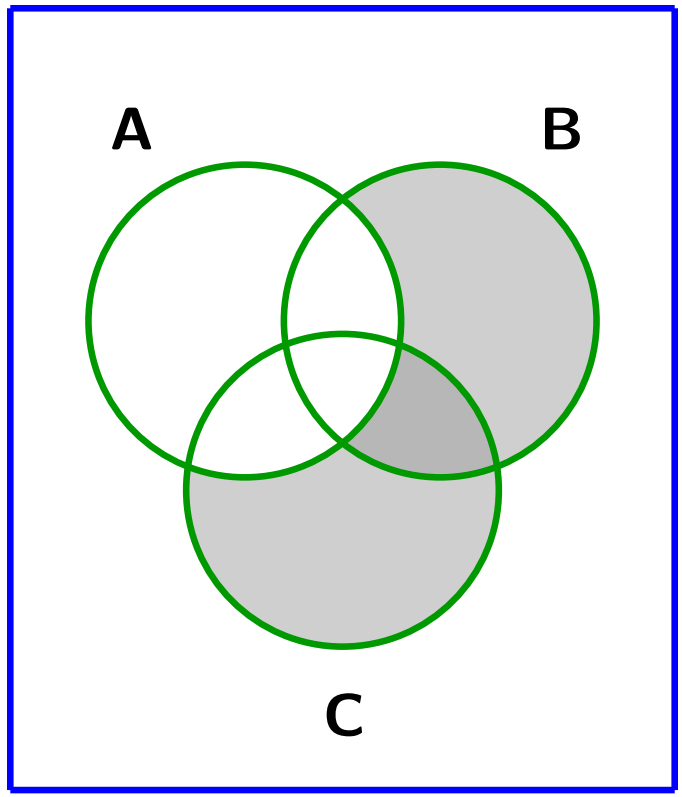
Question 1 Solution

First count how many cards contain a 4. Between 1 and 100, the cards containing 4s are 4, 14, 24, 34, 40, 41, .,49, 54, 64, 74, 84, 94. This is 19 cards. There are also 19 cards containing 4s between 100 and 200, and 19 between 200 and 300. So there are 300-19-19-19 = 243 cards that do not contain 4s.

[0]2:30

Question 2

Write down the set notation indicating the shaded region.



Question 2 Solution

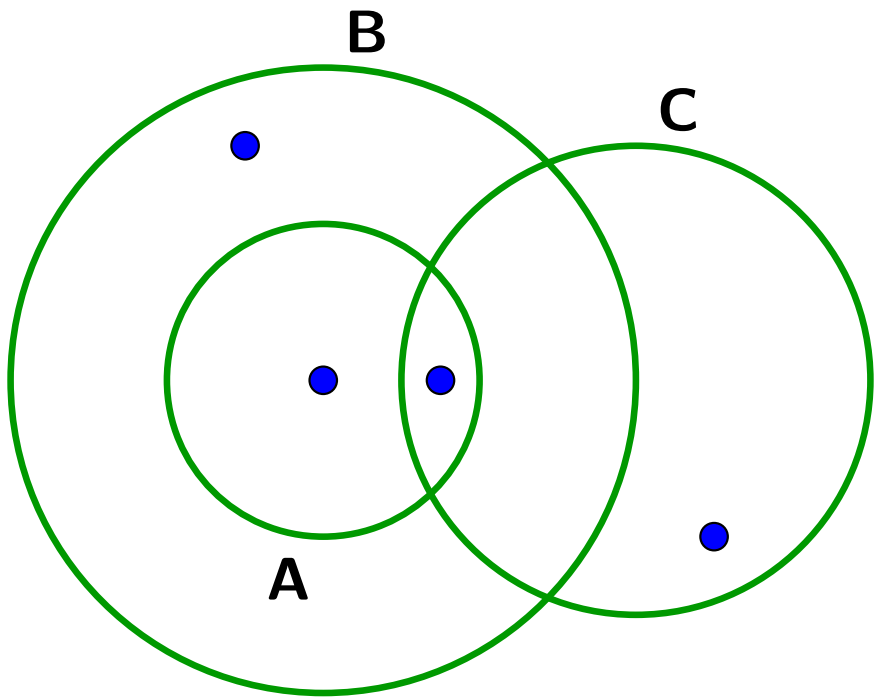
$$(B \cup C) \cap A'$$

Question 3

Sketch a three-circle Venn diagram that accurately represents the following set relationships:

$$A \subset B,\ C \not\subseteq B,\ \text{and}\ A \cap C \neq \emptyset$$

Question 3 Solution



Question 4

Determine if the conclusion is valid. Justify your answer using the ideas of converse, inverse or contrapositive.

Premises

- The alarm rings when we eat French fries.
- The alarm is ringing

Conclusion

We ate French fries.

Question 4 Solution

Invalid-the conclusion uses the converse which is invalid

Question 5

Sketch a Venn diagram to determine whether the conclusion follows logically from the premises.

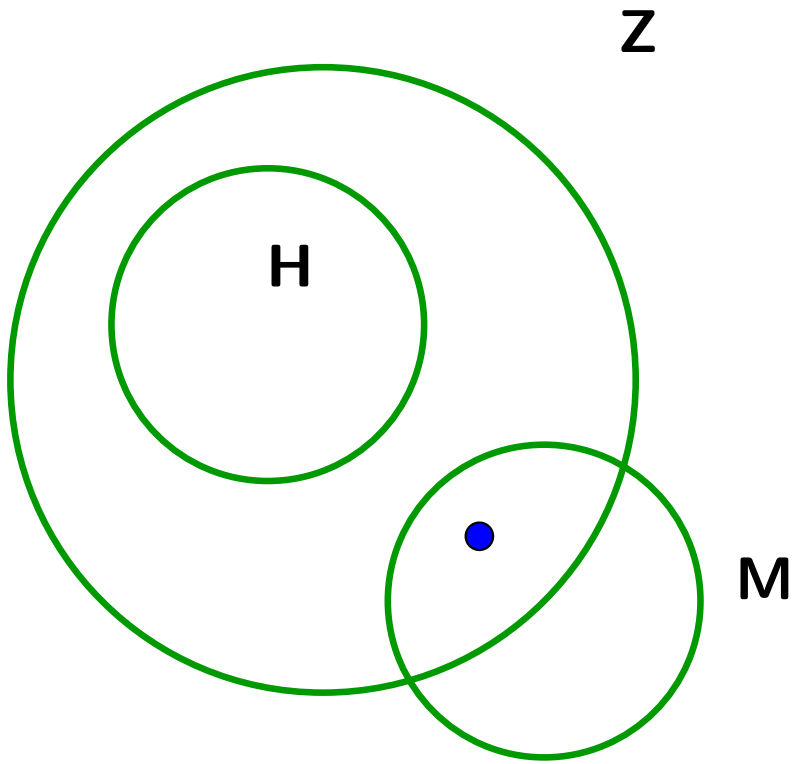
Premises

- All Heridians are Zeridians.
- Some Zeridians like marshmallows.

Conclusion

Some Heridians like marshmallows.

Question 5 Solution



H=Heridians,Z= Zeridians, M="People who like marshmallows" . The marshmallow circle must overlap the Zeridian circle because of our premise, but I can draw that and still not overlap the Heridian circle so it is possible that there are no Heridians who like marshmallows so the conclusion is invalid.

Question 6

Is the following sequence arithmetic, geometric, or neither? In either case what comes next?

$$295, 250, 205, 160, \_\_\_\_\_$$

Question 6 Solution

Arithmetic, 115

Question 7

Is the following sequence arithmetic, geometric, or neither? In either case what comes next?

$$-12, -7, 0, 9, \_\_\_\_\_$$

Question 7 Solution

Neither, 20

Question 8

Is the following sequence arithmetic, geometric, or neither? In either case what comes next?

$$3, 18, 108, 648, \_\_\_\_\_$$

Question 8 Solution

Geometric, 3888

Question 9

T = triangle, H = hexagon, S=square
Figure 1: T
Figure 2: TH
Figure 3: THSS
Figure 4: THSST
Figure 5: THSSTH

A. Assuming the pattern continues, what comes next?

B. How many squares in the 151^{st} figure?

Question 9 Solution

A. Figure 6: THSSTHSS

B. The 151^{st} figure has 100 squares

Question 10

List Polyas 4 steps for problem solving

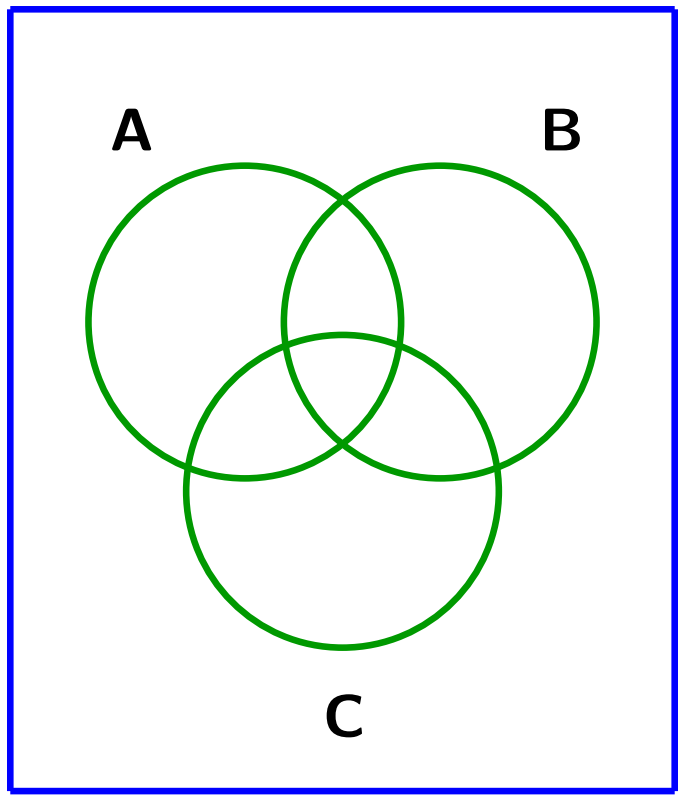
Question 10 Solution

1. Understand the Problem
2. Make a Plan
3. Carry Out the Plan
4. Look Back

Question 11

Shade a three circle Venn Diagram to represent

$$(A \cap B') \cup C$$



Question 11 Solution

$$(A \cap B') \cup C$$