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Subject: Labelling of categories within Venn Diagrams   **Topic:** Lecture 9 (NOT graded)
Author: ALEXANDRA GRACE ROBINSON   **Date:** 21 September 2009 9:55 PM

I understand why in the questions such as, 'something is good' and 'everything is good' the category of the circle is labelled 'good things'. However I don't understand why in the questions 'nothing exists' and 'God exists' is the category of the circle still labelled 'good things'.

I'm just a bit confused because I thought it would be something like 'existance'.

Thanks :)

Reply | Forward

Subject: Re:Labelling of categories within Venn Diagrams   **Topic:** Lecture 9 (NOT graded)
Author: Norva Y.S. Lo   **Date:** 22 September 2009 1:19 AM

You can think of categories as abstract groups which may or may not contain any members. For example, the category of unicorns may of may not contain any member. If you draw a circle labelled "unicorns" in a rectangle, what you mean is simply that the category of unicorns is being considered, but there may or may not be things belonging to the category. Only when you actually put a tick inside the circle do you commit yourself to saying that unicorns exist. And if you shade the circle then you are committed to saying unicorns don't exist. In short, by simply drawing a circle, but without adding a tick or a small letter or shading anything, you are not saying anything about the category yet. You are just indicating that the category might be of interest. But nothing has been said about it yet - if no shading is done and no tick or letter has been put in the diagram.

Now, likewise for the category "good things", if nothing is done to the Venn diagram containing a "good things" circle, we don't know if anything is good. Suppose the region inside the circle is 1, and the region outside is 2. Then by shading both 1 and 2, we are saying nothing exists inside region 1 (meaning that nothing is good), and also we are saying that nothing exists inside region 2 (meaning that nothing is not good). So, putting the two together, we have nothing is good and nothing is not good. But if anything exists at all, it has to be either good or not good. So, it follows from the shading of both 1 and 2, nothing exists what so ever.

We can have Venn diagram with no circle but just the rectangle. In that case, putting a small letter g, representing god, inside the rectangle just means that god exists in the universe. If there is n circle in the rectangle, then if the g is place half inside 1 and half inside 2, that means that either g is in 1 OR g is in 2, but not sure. That means god is either good or not good. But it is a tautology and uninformative to say that something is either good or not good, for everything is either good or not good. So, of course, god, if it exists, is either good or not good. As "good or not good" does not give any extra information we may as well simply say "god exists". In short, the singular statement "god is either good or not good" is logically equivalent to "god exists".

In general, we use the minimal way to describe a Venn diagram. If individual i is either A or not A - but we are not sure which, then we simply don't talk about A at all, and just say "individual i exists".

Best,

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Subject: Confusion with slide five   **Topic:** Lecture 12 (NOT graded)
Author: ALEXANDRA   **Date:** 11 October 2009 4:20 PM

Hi guys (and Norva)

I don't understand the first LHS column of slide five. For example the first diagram where the answer reads, 'something in A & not-B'. Why doesn't the answer also incorporate C. Afterall region 4 lies in the C circle and this is where part of the tick is situated.

This is the same for the two below in red.

Then the last one in the red column has a tick that is partially in region 5 which is apart of all of the circles. However the answer only mentions circle A and C.

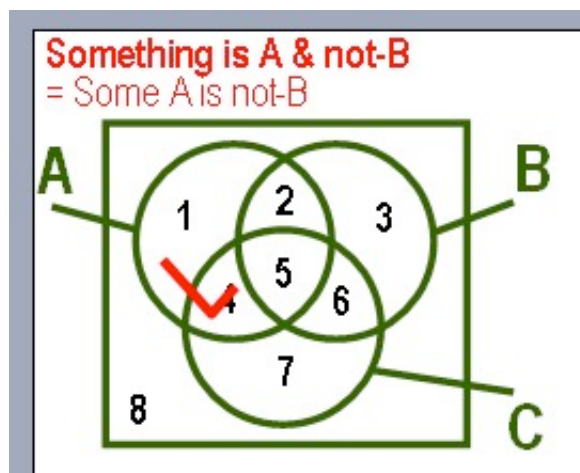I don't understand! Please help :)

| Reply | Forward |

Subject: Re:Confusion with slide five   **Topic:** Lecture 12 (NOT graded)
Author: Norva Y.S. Lo   **Date:** 13 October 2009 3:26 PM

When a tick (or a crooked line) appears in a Venn diagram, it means that something exists somewhere along the tick/line - but we don't know where exactly on the tick/line it is.

Now, in the first diagram on Slide 5 (LHS column - see above), there are three circles/categories, there is something to be said about each circle/category, namely:

(a) A tick is completely inside cricle A, which means "Something is A".
(b) The same tick is completely outside circle B, which means that "the same thing is not-B".
(c) The same tick is half inside and half outside circle C, which means that "the same thing may or may not be C - we are not sure".

So, putting all three pieces of information together we get the resultant statement: **"Something is A, and not-B, and may-or-may-not-be-C"**.

But everything is such that it "may-or-may-not-be-C". So, this piece of information does not tell us anything at all really. So, we can simply ignore it, and therefore simplify the resultant statement as: **"Something is A and not-B"**.

The same reasoning applies to all other similar cases, where a category appears in a Venn diagram, but the tick is placed in a position which does not tell us for sure whether anything exists in that category, and so that category is ignored all together in our description of the meaning of the placement of the tick.

Best,
Norva (lecturer, unit coordinator)

Attachments: somethingA&notB.jpg

Reply   Forward

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Subject: I forgot
Author: ALEXANDRA

Topic: Lecture 12 (NOT graded)
Date: 11 October 2009 9:39 PM

Oh and also with slide five....

- The second diagram within the purple column- it has a tick in region 2 and the solution is 'something is A & B & not-C'. Could I have just answered, 'something is A & B' and not mention the C at all?? Or would that have implied the tick would then extend over both region 2 and 5?

- the first picture on the RHS green column that has a tick extending over region 2, 4 & 5- the answer is 'some A is B or C' however this doesn't incorporate region 5 which represents 'something is A & B AND C'- not or. I just don't understand why we would put the 'or' instead of 'and'.

- In example 3.2 on slide 8 I don't understand how it can be invalid. The conclusion is 'not all red things are round' which is true because there is a tick partially in section 2 which expresses 'some red things are also natural things'. So how can it be invalid?

- In example 3.5 on slide 10 I also don't understand how it can be invalid. After representing all of the premises, the 'y' is situated in both 2 and 3 regions. Region 2 is apart of the red circle, and the conclusion states 'you are red' which is true because the letter 'y' is partially in the red circle. So how can it be invalid?

Sorry for all of the questions- just want to clarify how some things work.

Cheers!

[Reply] [Forward]

Subject: Re:I forgot
Author: Norva Y.S. Lo

Topic: Lecture 12 (NOT graded)
Date: 13 October 2009 4:02 PM

Question: "The second diagram within the purple column- it has a tick in region 2 and the solution is 'something is A & B & not-C'. Could I have just answered, 'something is A & B' and not mention the C at all?? Or would that have implied the tick would then extend over both region 2 and 5?"
Answer: Your understanding is correct. Given that the tick is placed completely inside circle C, the things is definitely C, and so you need to state that it is C. However, if the tick were placed half inside and half outside circle C, then it means that it may or may not be C, and so we don't ned to mention C at all. (see my previous reply).

Question: "The first picture on the RHS green column that has a tick extending over region 2, 4 & 5- the answer is 'some A is B or C' however this doesn't incorporate region 5 which represents 'something is A & B AND C'- not or. I just don't understand why we would put the 'or' instead of 'and'."
Answer: As explained in weeks 5-8, the "... or ..." used in this unit is inclusive, meaning "... or ... or both" So, "some A is B or C" means "some A is B or C or both".

Question: "In example 3.2 on slide 8 I don't understand how it can be invalid. The conclusion is

'not all red things are round' which is true because there is a tick partially in section 2 which expresses 'some red things are also natural things'. So how can it be invalid?"
Answer: In order for the conclusion of the argument to be true, a tick should appear (completely) inside the circle representing red things AND AT THE SAME TIME (completely) outside the circle representing round things, which means that "something is round and not-red". But the fact is that none of the ticks (representing the premises) in the diagram is such that it is completely inside the circle for red things and at the same time completely outside the circle of round things. So, the conclusion of the argument is not true - even if all the premises are true. Therefore, the argument is invalid.

Question: "In example 3.5 on slide 10 I also don't understand how it can be invalid. After representing all of the premises, the 'y' is situated in both 2 and 3 regions. Region 2 is apart of the red circle, and the conclusion states 'you are red' which is true because the letter 'y' is partially in the red circle. So how can it be invalid?"
Answer: Again: in order for something to belong to a category, the tick or the letter representing it must be placed completely inside the circle representing the category. If the thing is placed merely partly inside the cirlce, we are <u>not</u> entitled to conclude that the thing belong to be category.

Best,
Norva

Reply   Forward

Subject: Re:I forgot   **Topic:** Lecture 12 (NOT graded)
Author: ALEXANDRA   **Date:** 13 October 2009 8:46 PM
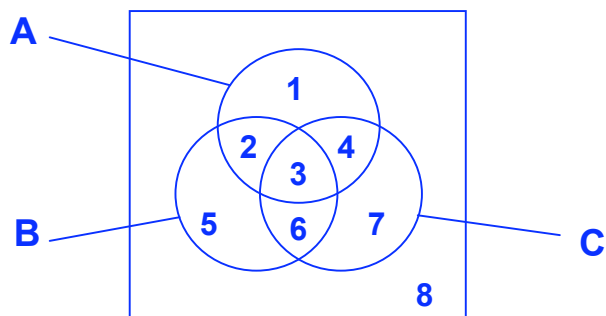
Fabulous! Thankyou so much Norva. I really understand now. :)

Reply   Forward

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Chapter 5, Exercises B, even-numbered questions, in R. Munson, Elements of Reasoning, 5th ed.

Instruction   To understand the model answer to each question, students need to:

(1) Draw their own Venn diagram starting with the dummy diagram given above.
(2) Replace "A", "B", "C" with the three specific categories stated in the model answer.
(3) Represent the premises in the ways stated by the first and second dot points in the model answer.
(4) Check the conclusion in the way stated by the third dot point in the model answer.
(5) Check the validity of the argument in the way stated by the forth dot point in the model answer

Answer to (2)

A = pro basketball players
B = fine athletes
C = professors of mathematics

- To represent 1st premise: shade 1, 4.
- To represent 2nd premise: shade 3, 4.
- For the conclusion to be true: both 3 and 6 should turn out to be shaded after the premises have been represented. That is not the case (because 6 is not shaded).
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.

Answer to (4)

A = snakes
B = things that are poisonous
C = things that should be destroyed

- To represent 1st premise: put a tick/line across 2, 3
- To represent 2nd premise: shade 2, 5.
- For the conclusion to be true: there should be a tick/line somewhere **inside** the area made up by 3 and 4 after the premises have been represented. That is indeed the case (because 2 is shaded so that the tick/line is pushed completely inside 3).
- The representation of the premises guarantees that of the conclusion. Thus, the argument is **valid**.

Answer to (6)

A = flying squirrels
B = mammals
C = birds

- To represent 1st premise: shade 1, 4
- To represent 2nd premise: shade 3, 6.
- For the conclusion to be true: both 3 and 4 should turn out to be shaded after the premises have been represented. That is indeed the case.
- The representation of the premises guarantees that of the conclusion. Thus, the argument is **valid**.

Answer to (8)

A = tortoises
B = those who are terrestrial
C = turtles

- To represent 1st premise: shade 1, 4
- To represent 2nd premise: put a tick/line across 4, 7.
- For the conclusion to be true: there should be a tick/line somewhere **inside** the area made up by 6 and 7 after the premises have been represented. That is indeed the case (because 4 is shaded so that the tick/line is pushed completely inside 7).
- The representation of the premises guarantees that of the conclusion. Thus, the argument is **valid**.

Answer to (10)

A = Martians
B = those who speaks English
C = officers on the Starship

- To represent 1st premise: shade 2, 3.
- To represent 2nd premise: shade 3, 6.
- For the conclusion to be true: both 6 and 7 should turn out to be shaded after the premises have been represented. That is not the case (because 7 is not shaded).
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.

Answer to (12)

A = spider
B = insects
C = lizards

- To represent 1st premise: shade 2, 3.
- To represent 2nd premise: shade 3, 6.
- For the conclusion to be true: both 3 and 4 should turn out to be shaded after the premises have been represented. That is not the case (because 4 is not shaded).
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.

Answer to (14)

A = students
B = hard workers
C = those who get very good grades

- To represent 1st premise: put a tick across 2, 3.
- To represent 2nd premise: put a tick across 3, 4.
- For the conclusion to be true: there should be a tick/line somewhere **inside** the area made up by 3 and 6 after the premises have been represented. That is not the case (because both ticks/lines are on the border, not inside, the area).
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.

Answer to (16)

A = murderers
B = those who were molested as children
C = those who deserve pity

- To represent 1st premise: put a tick/line across 2, 3.
- To represent 2nd premise: shade 2, 5
- For the conclusion to be true: there should be a tick/line somewhere **inside** the area made up by 3 and 4 after the premises have been represented. That is indeed the case (because 2 is shaded so that the tick/line is pushed completely inside 3).
- The representation of the premises guarantees that of the conclusion. Thus, the argument is **valid**.

Answer to (18)

A = those who read this book
B = those who find enlightenment
C = those who will become rich

- To represent 1st premise: shade 1, 4.
- To represent 2nd premise: put a tick across 3, 6
- For the conclusion to be true: there should be a tick/line somewhere **inside** the area made up by 1 and 2 after the premises have been represented. That is not the case.
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.

Answer to (20)

A = those who pay taxes
B = those who will receive a tax break
C = those who will be happy

- To represent 1st premise: shade 1, 4.
- To represent 2nd premise: shade 4, 7
- For the conclusion to be true: both 1 and 2 should turn out to be shaded after the premises have been represented. That is not the case (because 2 is not shaded).
- The representation of the premises does not guarantee that of the conclusion. Thus, the argument is **invalid**.