22. Some racial affirmative action programs are attempts to make amends for past injustices toward a given group.
No attempts to make amends for past injustices toward a given group discriminate simply because of race. (They discriminate because of past injustices.)

23. Some actions approved by reformers are right.
Some actions approved by society aren't approved by reformers.

24. Some wrong actions are errors made in good faith.
No error made in good faith is blameworthy.

25. All moral judgments are beliefs whose correctness cannot be decided by reason.
No objective truths are beliefs whose correctness cannot be decided by reason.

Here 1–3 defend the three classic views on free will: hard determinism, indeterminism, and soft determinism; 8 and 20 are from Immanuel Kant; 9 is from David Hume; 10 is from Richard Brandt; 17 and 18 are from Aristotle; and 19 is from Charles Hartshorne.

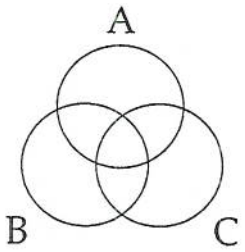
2.6 Venn diagrams

Now that we've mastered the star test, we'll learn a second test which is more intuitive (but also more difficult). Venn diagrams allow you to diagram the premises using three overlapping circles. We'll apply Venn diagrams only to *traditional syllogisms* (two-premise syllogisms with no small letters).

Here's how to do the Venn-diagram test:

> Draw three overlapping circles, labeling each with one of the syllogism's letters. Then draw the premises following the directions below. The syllogism is VALID if and only if drawing the premises *necessitates* drawing the conclusion.

First, we draw three overlapping circles:



Visualize circle A containing all A things, circle B containing all B things, and circle C containing all C things.

Within the circles are seven distinct areas:

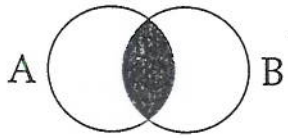
- The central area, where all three circles overlap, contains whatever has all three features (A and B and C).
- Three middle areas contain whatever has only two features (for example, A and B but not C).
- Three outer areas contain whatever has only one feature (for example, A but not B or C).

Each of the seven areas can be either empty or non-empty. We shade areas that we know to be empty. We put an "×" in areas that we know to contain at least one entity. An area without either shading or an "×" is unspecified; it could be either empty or non-empty.

Here is how we draw "no" and "some ... is ...":

"no A is B"

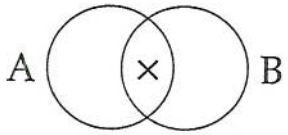
Shade wherever A and B overlap.



"No animals are beautiful" = "nothing in the animal circle is in the beautiful circle."

"some A is B"

"×" an unshaded area where A and B overlap.

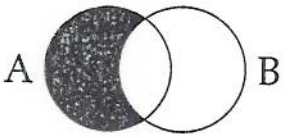


"Some animals are beautiful" = "something in the animal circle is in the beautiful circle."

Here is how we draw "all" and "some ... is not ...":

"all A is B"

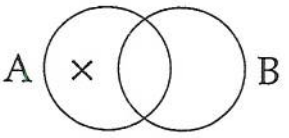
Shade areas of A that aren't in B.



"All animals are beautiful" = "everything in the animal circle is in the beautiful circle."

"some A is not B"

"×" an unshaded area in A that isn't in B.



"Some animals are not beautiful" = "something in the animal circle is outside the beautiful circle."

Again, shading means that the area is empty, while an "×" means that there is something in the area.

Follow these four steps (for now you can ignore the complication on the right, since it doesn't come up in our first three examples):

1. Draw three overlapping circles.
2. First draw "all" and "no" premises by shading.
3. Then draw "some" premises by putting an "×" in some unshaded area.
4. If you *must* draw the conclusion, then the argument is valid; otherwise, it's invalid.

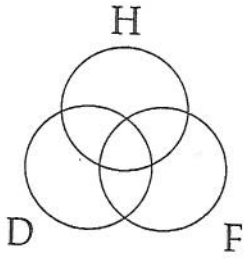
→

3a. When you draw "some," you sometimes can put the "×" in either of two unshaded areas. Then the argument is invalid; to show this, put the "×" in an area that *doesn't* draw the conclusion. (I suggest you first put "×" in *both* areas and then erase the "×" that draws the conclusion.)

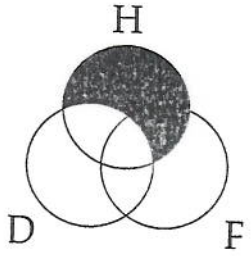
Let's try the test on the valid argument on the left:

all H is D Valid
no F is D
∴ no H is F

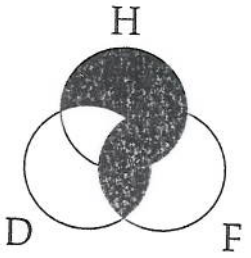
We draw three overlapping circles.



We draw "all H is D" by shading areas of H that aren't in D.



We draw "no F is D" by shading where F and D overlap.

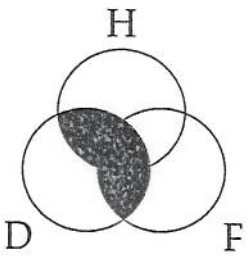


But then we've automatically drawn the conclusion "no H is F" – since we've shaded where H and F overlap. So the argument is valid.

Here's an invalid argument:

no H is D Invalid
no F is D
∴ no H is F

We draw "no H is D" by shading where H and D overlap. We draw "no F is D" by shading where F and D overlap.

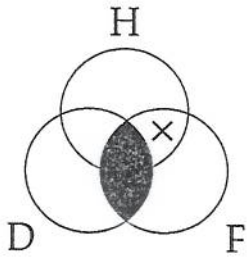


But then we haven't automatically drawn the conclusion "no H is F" (since we haven't shaded all the areas where H and F overlap). So the argument is invalid.

Here's a valid argument using "some":

no D is F Valid
some H is F
∴ some H is not D

We draw "no D is F" by shading where D and F overlap. We draw "some H is F" by putting "×" in some unshaded area where H and F overlap.



But then we've automatically drawn the conclusion "some H is not D" – since we've put an "×" in some area of H that's outside D. So the argument is valid. (Recall that we draw "all" and "no" first, and then we draw "some.")

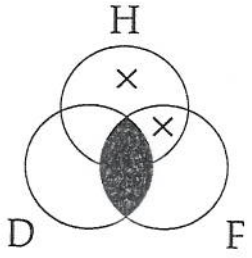
I earlier warned about a complication that sometimes occurs:

> 3a. When you draw "some," you sometimes can put the "×" in either of two unshaded areas. Then the argument is invalid; to show this, put the "×" in an area that *doesn't* draw the conclusion. (I suggest you first put "×" in *both* areas and then erase the "×" that draws the conclusion.)

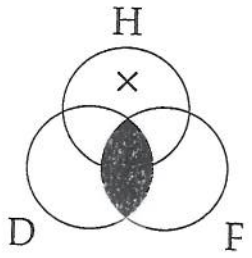
Here's such an example:

no D is F Invalid
some H is not D
∴ some H is F

We draw "no D is F" by shading where D and F overlap. We draw "some H is not D" by putting "×" in *both* unshaded areas in H that are outside D (since either "×" would draw the premise).



We then erase the "×" that draws the conclusion "some H is F." So then we've drawn the premises without drawing the conclusion.

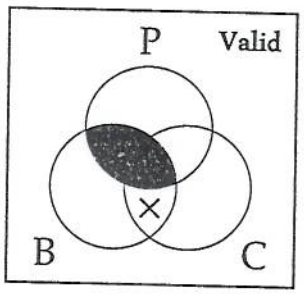


Since it's possible to draw the premises without drawing the conclusion, the argument is invalid. Since this problem is tricky, you might reread the explanation a couple of times until it's clear in your mind.

2.6a Exercise – also LogiCola BC

Test for validity using Venn diagrams.

no P is B
some C is B
∴ some C is not P



1. no B is C
   all D is C
   ∴ no D is B

2. no Q is R
   some Q is not S
   ∴ some S is R

3. all E is F
   some G is not F
   ∴ some G is not E

4. all A is B
   some C is B
   ∴ some C is A

5. all A is B
   all B is C
   ∴ all A is C

6. all P is R
   some Q is P
   ∴ some Q is R

7. all D is E
   some D is not F
   ∴ some E is not F

8. all K is L
   all M is L
   ∴ all K is M

9. no P is Q
   all R is P
   ∴ no R is Q

10. some V is W
    some W is Z
    ∴ some V is Z

11. no G is H
    some H is I
    ∴ some I is not G

12. all E is F
    some G is not E
    ∴ some G is not F

2.7 Idiomatic arguments

Our arguments so far have been phrased in a clear premise–conclusion format. Unfortunately, real-life arguments are seldom so neat and clean. Instead we may find convoluted wording or extraneous material. Important parts of the

argument may be omitted or only hinted at. And it may be hard to pick out the premises and conclusion. It often takes hard work to reconstruct a clearly stated argument from a passage.

Logicians like to put the conclusion last:

"Socrates is human. All humans are mortal. *So Socrates is mortal.*"	s is H all H is M ∴ s is M

But people sometimes put the conclusion first, or in the middle:

"Socrates must be mortal. After all, he's human and all humans are mortal."	"Socrates is human. *So he must be mortal* – since all humans are mortal."

In these examples, "must" and "so" indicate the conclusion (which always goes *last* when we translate the argument into logic). Here are some typical words that help us pick out the premises and conclusion:

These often indicate premises:	∴	*These often indicate conclusions:*
Because, for, since, after all ... I assume that, as we know ... For these reasons ...		Hence, thus, so, therefore ... It must be, it can't be ... This proves (or shows) that ...

When you don't have this help, ask yourself what is argued *from* (these are the premises) and what is argued *to* (this is the conclusion).

In reconstructing an argument, first pick out the conclusion. Then symbolize the premises and conclusion; this may involve untangling idioms like "Only A's are B's" (which translates as "all B is A"). If some letters occur only once, you may have to add unstated but implicit premises; using the "principle of charity," interpret unclear reasoning to give the best argument. Then test for validity.

Consider this twisted argument:

"You aren't allowed in here! After all, only members are allowed."

First we pick out the premises and conclusion:

Only members are allowed in here.	all A is M
∴ You aren't allowed in here.	∴ u is not A

Since "M" and "u" occur only once, we need to add an implicit premise linking these to produce a syllogism. We add a plausible premise and test for validity: