Mastering the Analytical Reasoning

Terms You’ll Need to Understand
✓ Logic Games
✓ Premise
✓ Conditions
✓ Questions

Techniques and Concepts You’ll Need to Master
✓ Practice to increase familiarity with game format
✓ Practice to recognize patterns of question formats
✓ Diagramming
✓ Sequence and Matrix
The LSAT always contains one Analytical Reasoning section. You’ll be given 35 minutes to work the section. Typically, the section will contain 23–24 questions. As with Reading Comprehension, the one variable in the Analytical Reasoning section is that you won’t be able to predict where it shows up in the order of the different sections of the exam.

**How It Stacks Up to the Other Sections**

Analytical Reasoning is the definitive “love it or hate it” kind of section. Although the section has no mathematical equations on it per se, it does seem that those who intuitively understand spatial reasoning and variable-laden equations (if set A, not set B) do best here. Those of us who enjoy brain teasers and abstract mental puzzles will enjoy what this section has to offer.

It’s important to remember that a lot of the fear people feel when facing this section is not due to the problems being incredibly difficult. Rather, it is unfamiliarity with facing a *logic game* for the first time. A logic game is a particular type of question that you will only find in this section of this exam.

This section usually contains four or five logic games, each of which commonly includes five to six questions—though seeing an especially complex problem with eight questions isn’t unheard of, particularly when the testers are trying to rattle you.

A sample of what a logic game might look like follows:

Charles has to put together a roster for his company’s annual softball game against their cross-town rival. He’s got eight healthy people that want to bat for the team: Corwin, Dorian, Hal, Joseph, Kamal, Peter, Ralph, and Seth. He’s allowed to submit five names for his roster. However, there are some things to take into consideration:

- If Ralph plays, Hal must play immediately after Ralph on the roster.
- Two of the three managers, Dorian, Kamal, and Ralph, have to be on the team.
- Corwin and Seth can’t be next to each other on the roster.
- If Kamal is on the team, then Joseph can’t be picked.
- Peter has to play either first or second.
Among the questions that people often have at this point is, “What on earth does this have to do with my ability to become an attorney?” While not as directly applicable as the skills tested for reading and evaluating conclusions from arguments, the Analytical Reasoning does play a vital role in the testing process. Logic games are, at base, designed to measure your ability to quickly understand a system of relationships and to draw conclusions about those relationships.

In this sample logic game, it’s arguable that how Charles puts together the roster for his company’s annual softball game isn’t applicable to legal training. However, what if Charles were your client in a complex tort case involving an industrial accident? Or a murder case where there were multiple gun shots being fired by a half-dozen individuals during a bank robbery? In these cases, being able to untangle a web of facts to draw the right conclusions—and even understanding who sat next to whom as the events unfolded—is a crucial skill.

Mastering the Analytical Reasoning Section

Although it may be frustrating to pre-law students who enrolled in college-level logic classes, those courses provide little solace on this portion of the LSAT. Philosophical argument, and especially the terminology and symbols used in formal logic, is of no practical use in the exam’s logic games.

However, not all is lost. There are two points to keep in mind that will allow you to master this section. The first is that your scores will start climbing immediately once you start practicing solving logic games. Because this section of the LSAT bears such little resemblance to any other test question you may have seen, the more you practice, the less the unfamiliarity of the questions will be a factor.

The second key concept to the mastery of this section is your ability to recognize patterns. For example, a great number of logic games will involve spatial awareness. These can be drawn from questions where

- You line up objects or people in a sequence.
- You divide up an object or set of objects into specific groups.
- You arrange subjects in a specific pattern, say on a shelf or around a table.
Other logic games involve applying seemingly random criteria to a category or people or objects to create a specific kind of order:

➤ You draw conclusions as to the sequence of events. (If A, then B happens, creating condition C.)

➤ You select an object that has one or more characteristics.

➤ You assign attributes to each object in a set based on the question’s descriptions.

The reason that these two attributes of the Analytical Reasoning section will help you is that logic games, though they look like a tangle of yarn at first glance, are innately limited in how they can be written. With enough practice, it is highly unlikely that the writers of the LSAT will be able to come up with a challenging question that you haven’t tried to tackle before.

Some other items to keep in mind to master this section include

➤ Throughout the section, the difficulty of the logic games presented will vary randomly, but there are two general rules. First, the initial game that opens the section will not be the most difficult one. Second, the final one or two questions are typically more complex than the others.

➤ Time is your enemy in this section. You will not be able to rush on any question—there are no “easy questions” that take significantly less time than others. If you can keep a steady pace and not allot more than 10 minutes to any one logic game, you will be fine. Of course, the amount of time that you spend on any logic game depends upon how complex or simple it is. A simple game could take you 6–7 minutes, while more complex games might require a solid 10-minute investment of your time.

➤ If you’re stuck on one game, it may be best to skip it and return if you can. However, don’t skip more than one game. Allocating your entire time to only two of four game results is proof that you need to practice more to pick up your pace. Additionally, trying to skip over no more than one game will reduce the chance that you’ll be left with blind guessing over a large number of remaining questions, giving you a better chance for a higher score.

There is no single question type that is inherently much more difficult or time consuming than other types. You will not benefit if you plan to skip every question of a given type. Remember, the level of difficulty in this section is not raised by changing the type of question (which is already pretty limited by the format). Difficult is only increased by the number of variables (people around a table, colors on a set of objects) in the question.
Diagramming out the question will be useful in this section, so remember that the LSAT includes a couple pages of scratch paper in the back of the test booklet. You can also use the space provided at the bottom of each page of the Analytical Reasoning section.

Unless you think best in your head as opposed to on paper, for most people an effective diagram will help you to think about a question clearly. The key to an effective diagram is to keep it neat. If you misplace people in the wrong set of chairs, it’s best to cross out the diagram and redo it; simply scratching out names or writing on top of incorrect answers will likely confuse you at a critical time.

Logic Game Components

Each logic game has three separate components: the premise, the conditions, and the questions. The *premise* establishes the subjects (objects or people) and setting for the game. Part of the difficulty level of the question is established via the number of subjects in a game. This generally ranges from 5 to as many as 10.

In our original example of a logic game, the premise would be

Charles has to put together a roster for his company’s annual softball game against their cross-town rival. He’s got eight healthy people that want to bat for the team: Corwin, Dorian, Hal, Joseph, Kamal, Peter, Ralph, and Seth.

*Conditions* follow the premise by imposing series of rules or conditions that determine the relationships among the subjects. Together with the premise, the number of the conditions (usually 4 to 6) is the second variable in determining how difficult the question is. Obviously, the more premises and conditions there are, the higher the level of difficulty you can expect the question. Continuing with our example, the conditions would include

If Ralph plays, Hal must play immediately after Ralph on the roster.
Two of the three managers, Dorian, Kamal, and Ralph, have to be on the team.
Corwin and Seth can’t be next to each other on the roster.
If Kamal is on the team, then Joseph can’t be picked.
Peter has to play either first or second.
Questions based on the relationship of the conditions to premises will follow. For this example, one question could be

Which one of these rosters can be submitted?

- A. Peter, Hal, Corwin, Kamal, Ralph
- B. Peter, Dorian, Kamal, Corwin, Seth
- C. Dorian, Ralph, Hal, Peter, Joseph
- D. Dorian, Peter, Ralph, Hal, Seth
- E. Peter, Seth, Joseph, Ralph, Hal

Unlike what you may find in the sections on Logical Reasoning or Reading Comprehension, there is usually less hesitation when it comes to picking answers to the question. Rather like mathematical problems, only one—or at most two—answers will be correct—or seem to be correct—based on your deductions. While it is possible to pick the wrong answer if you've misread the question or diagrammed it out incorrectly, you will rarely if ever be in the position where “It could be answer A, B, or C, what does my gut feeling say?”

Don't carry over information provided in any particular question to other questions. Each question exists in its own universe. And just as in the other sections of the LSAT, no matter how odd the answer you come up with may be in real life, it will be correct in the context of that question.
Exam Prep Questions

1. The two most common diagrams that you’ll rely on to solve logic games are the sequence and the matrix. Let’s start by looking at our initial example question, which can be best solved using the first of these two diagrams.

Charles has to put together a roster for his company’s annual softball game against their cross-town rival. He’s got eight healthy people that want to bat for the team: Corwin, Dorian, Hal, Joseph, Kamal, Peter, Ralph, and Seth.

If Ralph plays, Hal must play immediately after Ralph on the roster.

Two of the three managers, Dorian, Kamal, and Ralph, have to be on the team.

Corwin and Seth can’t be next to each other on the roster.

If Kamal is on the team, then Joseph can’t be picked.

Peter has to play either first or second.

In this game, you can expect the LSAT testers to ask you to solve for two different things. First, you may have to pick five people out of eight, so expect to get three basic questions posed in one form or another:

➤ Who can be in the group?
➤ Who must be in the group?
➤ Who cannot be in the group?

Second, the most likely follow-up question you will encounter in a question when you have positions discussed (for example, Peter has to play first or second) is that you’ll have to pick a specific order of the team.

This means you’ll have to worry about positions of people in the roster, such as

➤ Who is first/second/third/fourth/last?
➤ Which of these rosters can be submitted?
➤ Which of these rosters is not possible?

One factor that the LSAT creators always take into account is that they won’t add extra levels of difficulty to questions by throwing too many similarly named people at you. For example, it’s highly unlikely you’d see a question similar to the example using the names Ralph, Roy, Roark, Ray, Robert, and Rick.
Before you even jump to the questions, it's best to diagram out the conditions so that you can answer whatever the testers plan to throw your way. One simple way to do this here is to represent your answer as a five letter sequence, or roster, from left to right. This would visually signify the order that the people can play in. For example, let's say you choose Corwin, Dorian, Hal, Joseph, and Kamal to play in that specific order. You'd represent it diagrammatically as

C-D-H-J-K

If you're unsure of a certain spot in the roster, just represent it with a question mark (?).

Next, represent the additional conditions cited in the question as “sub-chains” or pieces of the puzzle to help us determine the final solution.

Rule 1: If R, then R-H.

If Ralph plays, then we know two players on the roster: Ralph, and Hal immediately after him.

Rule 2: From set (D, K, R), exactly two will play.

Basically, out of the set of three people (Dorian, Kamal, Ralph), exactly two will play. Notice that this isn't “can” play, we know that two of these people will be on the roster.

Rule 3: Not (C-S) AND Not (S-C)

Basically, Corwin and Seth cannot be immediately before or after each other, if they are to play on the team.

Rule 4: If K, then not J

If Kamal plays, then Joseph isn't playing. Of course, we can reverse this rule to come up with the corollary:

Rule 4 (reverse): If J, then not K.

If Joseph is on the team, then Kamal can't be on the team, because if he was, it would violate the fourth rule.

Rule 5: P-?-?-? or ?-P-?-?-?

We use the roster representation to show that Peter is either on the first or second position on the roster.
Next, apply your newly diagrammed rules to the question that applies to this logic game. Use the rules as tools to go through and eliminate wrong answers, those that break one of the rules given to us, until we're left with one correct answer.

**Question:**

Which one of these rosters can be submitted?

- A. Peter, Hal, Corwin, Kamal, Ralph
- B. Peter, Dorian, Kamal, Corwin, Seth
- C. Dorian, Ralph, Hal, Peter, Joseph
- D. Dorian, Peter, Ralph, Hal, Seth
- E. Peter, Seth, Joseph, Ralph, Hal

2. Our second sample question also pertains to the order of objects in a group (in this case puppies instead of softball players). While this could also conceivably be solved with the sequence diagram, if you need more visual representation of a problem, the “matrix” diagram may be more useful.

The premise and conditions of the logic game are

On the third Thursday of every month, eight Labrador Retriever puppies (Anne, Boris, Cassie, Daisy, Early, Fancy, Gloria, and Harley) from the Guiding Eyes for the Blind visit the veterinarian’s office for their monthly checkup. Each puppy is either a black lab or a yellow lab. The puppies each arrive at the office at a different time. The following conditions apply:

➤ Gloria arrives at the vet’s office before Fancy but after Anne
➤ Cassie arrives at the vet’s office before Gloria
➤ Boris arrives at the vet’s office after Anne but before Fancy
➤ Fancy arrives at the vet’s office before Daisy.

Again, let’s diagram out the conditions so that you can answer whatever the testers plan to throw your way in this game. The first condition tells you the following about the order of arrival of the puppies at the vet’s office:

Anne
Gloria
Fancy

The second condition tells you that Cassie arrived before Gloria, but does not tell you whether or not he arrived before Anne. So at this point, either one of the following orders is possible:
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Alternative #1 | Alternative #2
--- | ---
Cassie | Anne
Anne | Cassie
Gloria | Gloria
Fancy | Fancy

The third condition tells you that Boris arrived after Anne but before Fancy, but does not tell you whether or not he arrived before or after Gloria, or before or after Cassie. So now the following are possibilities:

| #1 | #2 | #3 | #4 | #5 |
--- | --- | --- | --- | ---
Cassie | Cassie | Anne | Anne | Anne |
Anne | Anne | Cassie | Cassie | Boris |
Boris | Gloria | Boris | Gloria | Cassie |
Gloria | Boris | Gloria | Boris | Gloria |
Fancy | Fancy | Fancy | Fancy | Fancy |

The fourth condition tells you that Fancy arrives before Daisy, providing the following alternatives:

| #1 | #2 | #3 | #4 | #5 |
--- | --- | --- | --- | ---
Cassie | Cassie | Anne | Anne | Anne |
Anne | Anne | Cassie | Cassie | Boris |
Boris | Gloria | Boris | Gloria | Cassie |
Gloria | Boris | Gloria | Boris | Gloria |
Fancy | Fancy | Fancy | Fancy | Fancy |
Daisy | Daisy | Daisy | Daisy | Daisy |

No information is provided about the relative arrival time of Early or Harley.

If you now provide that Cassie arrives after Boris, but keep all of the other conditions intact, the relative order must be as set forth in Alternative #5:

1. Anne
2. Boris
3. Cassie
4. Gloria
5. Fancy
6. Daisy
Although no information is provided about when Early or Harley arrived, you know that at most the arrival order of all of the others dogs can only shift down one or two spots from the order shown previously.

Finally, apply your newly diagrammed rules to the question and eliminate wrong answers, until we’re left with one correct solution. With this information mapped out, you can proceed to answer the following question:

Question:

If Cassie arrives after Boris, which one of the following must not be true?

- A. Anne is the second of the puppies to arrive at the vet’s office.
- B. Boris is the fifth of the puppies to arrive at the vet’s office.
- C. Cassie is the third of the puppies to arrive at the vet’s office.
- D. Daisy is the sixth of the puppies to arrive at the vet’s office.
- E. Fancy is the seventh of the puppies to arrive at the vet’s office.
Exam Prep Answers

1. Choice A is incorrect. Rule 1 states that Hal plays after Ralph on the roster. If we go through the list, we see that in answer choice A, Hal plays way before Ralph, so this roster is invalid.

Choice B is incorrect. Rule 3 states that Corwin and Seth can’t be next to each other in the roster. However, we can see that answer choice B has them batting fourth and fifth, which violates this rule.

Choice C is incorrect. Rule 5 states that Peter must be first or second in the rotation. Going through the two remaining answer choices, we see that he’s fourth in answer choice C, which makes this choice an invalid roster.

Choice E is incorrect. Rule 2 states that of the set Dorian, Kamal, Ralph, exactly two of those three people must be on the team. As we go through the remaining choices, we see that answer choice E only has Ralph and not Dorian or Kamal.

We’re left with one answer choice, D, which is the correct answer.

2. Choice A is incorrect. Anne can be anywhere from either the first, second, or third puppy to arrive at the vet’s office, so this choice might be true, and therefore is incorrect.

Choice C is incorrect. Cassie can be the third, fourth, or fifth puppy to arrive at the vet’s office, so this answer might be true and therefore is incorrect.

Choice D is incorrect. Daisy can be the sixth, seventh, or eighth puppy to arrive at the vet’s office, so this answer might be true and therefore is incorrect.

Choice E is incorrect. Fancy can be the fifth, sixth, or seventh puppy to arrive at the vet’s office, so this answer might be true and therefore is incorrect.

By process of elimination, Choice B is correct. Boris can be either the second, third, or fourth puppy to arrive at the vet’s office. Since he cannot be the fifth to arrive, this choice cannot be true and therefore is the correct answer.