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Logical Reasoning Tricks and Techniques for
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LOGIC REASONING- LOGIC (English)

Q1: In a group of runners, David finished 12th. If there were 3 people who didn't participate but would have finished between David and the last runner, what was David's original rank?

Long Method: We know David's original position was higher than 12th because non-participants would have placed lower.

- Add the number of non-participants (3) to David's original rank (12).
- David's original rank = 12 + 3 = 15th.

Short Method (Tips and Tricks): Consider David's final position (12) as the starting point. Since non-participants would have been behind him, subtract their number (3) to find his original rank.

- Original rank = Final rank - Non-participants = 12 - 3 = 15th.

Q2: Sarah introduces Michael as her "brother's son-in-law." How is Michael related to Sarah?
Long Method:

- Break down the relationship: "brother's son" refers to Sarah's nephew.
- "Son-in-law" implies Michael is married to Sarah's nephew's wife.
- Since a wife is not directly related by blood, Michael is not Sarah's blood relative.

Short Method (Tips and Tricks): Identify keywords. "Brother's son" indicates a nephew, but "son-in-law" suggests marriage to someone outside the immediate family. Thus, not a blood relative.

Q3: In a code, 'CAT' is written as '123' and 'DOG' is written as '456.' How is 'GOAT' coded?
Long Method:

- Assume a simple alphabetic substitution cipher where each letter corresponds to a unique number.
- Analyze the given codes: 'C' = 1, 'A' = 2, 'T' = 3, 'D' = 4, 'O' = 5, 'G' = 6.
- Apply this pattern to 'GOAT': G (6) + O (5) + A (2) + T (3) = 16.

Short Method (Tips and Tricks): Notice the constant difference (1) between consecutive letters in both codes. Apply this difference to 'GOAT': Start with 6 (for G) and keep adding 1 for each letter.

- Encoded value = 6 + 1 + 2 + 3 = 12.

Q4: Six friends, A, B, C, D, E, and F, are sitting around a circular table. If A is not next to B or C, and E is opposite D, who is sitting next to C?
Long Method:

- Since A is not next to B or C, they must be on opposite sides of the table.
- If E is opposite D, then D cannot be next to C either (as they would be opposite A and B).
- This leaves only one remaining position next to C: F.

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Short Method (Tips and Tricks): Visualize the table. Eliminate possibilities based on the given constraints. Since A is not next to B or C, they are opposite. Similarly, E's opposite position is occupied by D. By process of elimination, F must be next to C.

Q5: If today is Wednesday, what day will it be 14 days from now?
Long Method:
- There are 7 days in a week.
- Divide 14 by 7 to find the number of complete weeks that pass (2 weeks).
- Since there are no remainder days, we simply move forward 2 days from Wednesday.
- 14 days from now will be Friday.

Short Method (Tips and Tricks): Identify patterns. Wednesday is the 3rd day of the week (counting from 0 for Monday). Add 14 days (which is a multiple of 7) and you'll end up at the same weekday (Wednesday). However, since we're moving forward 2 "cycles" of 7 days, add 2 to the starting day to get Friday.

Q6: All doctors are scientists. Some scientists are engineers. Thus, all doctors are engineers. (True or False)
Long Method:
- Analyze the syllogism's structure. The first statement is a universal affirmative ("All doctors are scientists").
- The second statement is a particular affirmative ("Some scientists are engineers").
- A universal conclusion ("All doctors are engineers") cannot be drawn from these premises.

Short Method (Tips and Tricks): Identify the quantifiers ("all," "some"). The conclusion attempts to extend the first statement's universality to engineers, which is invalid. Doctors could be a subset of scientists who are not all engineers.

Q7: There are three boxes: A, B, and C. One box contains a gold coin, another a silver coin, and the third is empty. Each box has a label, but none is correct. Box A is labeled "silver," Box B is labeled "gold," and Box C is labeled "empty." By opening only one box, can you determine the location of the gold coin?
Long Method:
- Since none of the labels are true, we can eliminate the possibility of the gold coin being in Box B (labeled "gold").
- If you open Box A (labeled "silver") and find a silver coin, then the gold coin must be in Box C (labeled "empty").

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- Alternatively, if you open Box A and find it empty, then the gold coin must be in Box B (labeled "gold").

Short Method (Tips and Tricks): Focus on the contradiction. Only one label can be partially true (indicating the wrong location of one coin). Open the box labeled with the opposite coin (Box A, labeled "silver"). If it's silver, the gold coin is in the empty box (C). If it's empty, the gold coin is in the box labeled "gold" (B).

Q8: A survey asks students if they prefer soccer (S) or basketball (B). Some students like both. The results show 40 students like soccer, 30 like basketball, and 10 like both. How many students participated in the survey?
Long Method:
- Represent the information in a Venn diagram with two overlapping circles (S and B).
- Since 10 students like both, place them in the intersection.
- Subtract the overlap from the individual counts to find the number who like only soccer (40 - 10 = 30) and only basketball (30 - 10 = 20).
- Add all the sections of the Venn diagram to find the total number of students: 30 (only soccer) + 20 (only basketball) + 10 (both) = 60 students.

Short Method (Tips and Tricks): Focus on non-overlapping areas. Add the number who like only soccer (40 - 10 = 30) and only basketball (30 - 10 = 20) to those who like both (10). This represents the total number of students (60).

Q9: A bag contains 5 red marbles and 7 blue marbles. You draw one marble without replacement. What is the probability of drawing a red marble?
Long Method:
- Calculate the total number of marbles (5 red + 7 blue = 12 marbles).
- Calculate the number of favorable outcomes (drawing a red marble = 5 red marbles).
- Probability = Favorable outcomes / Total outcomes = 5/12.

Short Method (Tips and Tricks): Identify the ratio of favorable outcomes to total outcomes. Since you're interested in red marbles, consider the number of red marbles (5) relative to the total number of marbles (12). Probability = 5/12.

Q11: Car is to engine as airplane is to what?
- **Long Method:** Analyze the relationship between car and engine. An engine provides power for a car to function. Apply this concept to airplanes. The airplane's engine is the most likely answer.

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- **Short Method (Tips and Tricks):** Identify the function. Car needs an engine to move, so find what makes an airplane fly (engine).

Q10. Conditional Statements: If it is raining, then the ground is wet. The ground is wet. Therefore, it is raining. (True or False)

- **Long Method:** Analyze the statement structure. The first sentence is a conditional statement (If A, then B). The second sentence affirms the consequent (B). However, a valid conclusion can only be drawn by affirming the antecedent (A).

- **Short Method (Tips and Tricks):** Identify the logical fallacy. The argument commits the fallacy of affirming the consequent. Just because the ground is wet doesn't guarantee it's raining (other factors could cause wetness).

Q11. Puzzles: You have 12 coins, and one of them is counterfeit, weighing slightly less than the others. Using only a balance scale twice, can you identify the counterfeit coin?

- **Long Method:** Divide the coins into three groups of four. Weigh two groups. If they balance, the counterfeit coin is in the remaining group. Weigh two coins from the unbalanced group. If they balance, the counterfeit coin is the remaining one. If they don't balance, the lighter coin is counterfeit.

- **Short Method (Tips and Tricks):** Exploit the limited comparisons. In the first weighing, eliminate the balanced group. In the second weighing, compare two coins from the remaining unbalanced group. The lighter one (or the one left if they balance) is counterfeit.

Q12. Series Completion: 2, 4, 8, 16, ... What is the next number in the sequence?

- **Long Method:** Identify the pattern. Each number is doubled to get the next one.

- **Short Method (Tips and Tricks):** Look for a consistent difference or operation. Double the last number (16) to get 32.

Q13. Assumptions: John failed his history exam. We can assume that John:
(a) Did not study.
(b) Is bad at history.

- **Long Method:** Analyze the statement. John failing the exam doesn't necessarily imply he didn't study (other factors could be involved). However, it suggests he might have some difficulty with the subject matter.

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- **Short Method (Tips and Tricks):** Identify the most likely implication. Not studying is a possibility, but failing suggests some struggle with the subject itself (b).

Q14. Fallacies: Everyone on the debate team is intelligent. Sarah is on the debate team. Therefore, Sarah is intelligent. (True or False)

- **Long Method:** Analyze the argument structure. The statement commits the fallacy of hasty generalization. Being on the debate team doesn't guarantee intelligence.

- **Short Method (Tips and Tricks):** Identify the generalization fallacy. Not everyone on the team is guaranteed to be intelligent.

Q15.. Inferences: It is a sunny day. The temperature is above 70 degrees Fahrenheit. We can infer that:
   (a) It will rain later today.
   (b) People will go to the beach.

- **Long Method:** Analyze the statements. Sunny weather and high temperature don't necessarily lead to rain (a). However, they create conditions favorable for going to the beach (b).

- **Short Method (Tips and Tricks):** Identify the most likely consequence. Rain isn't guaranteed, but good weather makes going to the beach more likely (b).

Q16. Strengthening Arguments: Which statement strengthens the argument "Studying hard will improve your grades"?
   (a) Most students who study hard get good grades.
   (b) Studying hard is the only way to get good grades.

- **Long Method:** Analyze the argument. Statement (a) provides evidence supporting the connection between studying and good grades, strengthening the argument.

- **Short Method (Tips and Tricks):** Look for evidence that supports the cause-and-effect relationship. Statement (a) shows a correlation, while (b) is an overgeneralization.

Q17. Course of Action: You left your wallet at a restaurant. What should you do first?

- **Long Method:** Analyze the situation. Your primary concern is retrieving your wallet. You can call the restaurant to inquire, then head there to check.

- **Short Method (Tips and Tricks):** Prioritize based on urgency. Retrieving your wallet is the most pressing issue.

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Q18. Statements and Conclusions: Statement 1: All cats are mammals. Statement 2: Whiskers is a mammal. Conclusion: Whiskers is a cat. (True or False)

- **Long Method:** Analyze the statement structure. Statement 1 is a universal affirmative ("All cats are mammals"). Statement 2 identifies Whiskers as a mammal. A valid conclusion can be drawn to affirm the membership ("Whiskers is a cat").

- **Short Method (Tips and Tricks):** Identify if the conclusion follows logically. Statement 1 establishes that mammals can be cats, and Statement 2 confirms Whiskers is a mammal, thus the conclusion is valid.

Q19. Data Sufficiency: Is the following information sufficient to answer the question: "What is the average age of the five employees in a company?"

- (a) The total age of all five employees.
- (b) The ages of three of the employees.
- **Long Method:** To find the average, you need to know the sum of all ages and then divide by the number of employees (5).
  (a) provides the total age, but not the number of employees (insufficient).
  (b) provides individual ages of only three employees (insufficient).

- **Short Method (Tips and Tricks):** Identify what's missing for calculation. Average requires both sum (a) and number of elements (missing). Individual ages in (b) aren't enough.

Q20. Definitions: Match the following terms with their definitions:

(a) Hypothesis
(b) Theory

1. A well-tested explanation that has broad explanatory power.
2. A tentative explanation that guides investigation.
- **Long Method:** Analyze the definitions. A hypothesis is a proposed explanation (2). A theory is a well-established explanation with evidence (1).

- **Short Method (Tips and Tricks):** Match keywords. "Tentative" suggests a hypothesis (2), while "well-tested" points to a theory (1).

Q21. Ethics: You find a wallet with a large sum of money on the sidewalk. What is the ethical thing to do?

- **Long Method:** Ethical behavior involves honesty and returning lost items to their rightful owner.

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- **Short Method (Tips and Tricks):** Apply the golden rule. Do what you would want someone to do if you were in the same situation (return the wallet).

Q22. Multiple Inference: A red car is parked in the driveway. We can infer that:
(a) The car belongs to the homeowner.
(b) The car is new.
- **Long Method:** Analyze the statement. The car's color doesn't tell us who owns it (a) or its age (b).

- **Short Method (Tips and Tricks):** Identify what's directly implied. Color doesn't tell us ownership or age.

Q23. Assumptions: The light bulb burned out. We can assume that:
(a) The light switch is broken.
(b) The bulb needs to be replaced.
- **Long Method:** Analyze the statement. A burned-out bulb suggests it needs replacing (b). It doesn't necessarily mean the switch is broken (a).

- **Short Method (Tips and Tricks):** Identify the most likely implication. The switch could be fine, but the bulb definitely needs replacing (b).

Q24. Argument Evaluation: The company needs to increase sales. Therefore, they should lower their prices. Is this argument strong?
- **Long Method:** Analyze the argument structure. Lowering prices might increase sales, but other factors could also be at play (e.g., marketing).

- **Short Method (Tips and Tricks):** Identify alternative explanations. Lowering prices might help, but it's not the only factor affecting sales.

Q25. False Dichotomy: You can either exercise regularly or eat healthy to lose weight. Is this statement a valid representation of weight loss options?
- **Long Method:** Analyze the argument structure. The statement presents only two options, implying that these are the only ways to lose weight. This is a false dichotomy as other factors (e.g., sleep, genetics) can also play a role.

- **Short Method (Tips and Tricks):** Identify lack of alternatives. Other factors besides these two can contribute to weight loss.

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Q26. Strengthening Arguments: Which statement strengthens the argument "Vaccines are safe and effective"?

- (a) Millions of people have been vaccinated with no serious side effects.
- (b) Vaccines are a conspiracy by pharmaceutical companies.
- **Long Method:** Analyze the argument. Statement (a) provides evidence supporting the safety and effectiveness of vaccines, strengthening the argument.

- **Short Method (Tips and Tricks):** Look for evidence that supports the claim. Statement (a) shows a positive safety record, while (b) is irrelevant and undermines the argument.

Q27. Weakening Arguments: Which statement weakens the argument "Watching violent movies increases aggression"?

(a) Some people who watch violent movies are not aggressive.
(b) Violent movies can be entertaining.
- **Long Method:** Analyze the argument. Statement (a) provides a counter-example, weakening the connection between watching violent movies and aggression.

- **Short Method (Tips and Tricks):** Identify exceptions that challenge the cause-and-effect link. Statement (a) shows not everyone becomes aggressive, while (b) doesn't address the aggression claim.

Q28. Course of Action: Your computer has a virus. What should you do first?

- **Long Method:** Analyze the situation. To prevent further damage, you should isolate the computer and then run a virus scan or seek professional help.

- **Short Method (Tips and Tricks):** Prioritize based on urgency. Isolate the computer to prevent further infection before attempting removal.

Q29. Statements and Conclusions: Statement 1: All doctors wear white coats. Statement 2: Sarah is wearing a white coat. Conclusion: Sarah is a doctor. (True or False)

- **Long Method:** Analyze the statement structure. Statement 1 is a universal affirmative ("All doctors wear white coats"). Statement 2 identifies Sarah wearing a white coat. However, a universal affirmative doesn't guarantee the converse (not all who wear white coats are doctors). The conclusion might not be true.

- **Short Method (Tips and Tricks):** Identify if the conclusion necessarily follows. While some doctors wear white coats, others might not, and other professions might use them too. The conclusion is not guaranteed.

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Q29. Data Sufficiency: Is the following information sufficient to answer the question: "What is the average score on the math exam?"

- (a) The total score of all students and the number of students who took the exam.
- (b) The highest and lowest scores on the exam.
- **Long Method:** To find the average, you need to know the sum of all scores and then divide by the number of students. Statement (a) provides both pieces of information (sufficient). Statement (b) only gives the extremes, not the complete picture (insufficient).

- **Short Method (Tips and Tricks):** Identify what's missing for calculation. Average requires both sum (a) and number of elements. Highest and lowest scores in (b) aren't enough.

Q30. Definitions: Match the following terms with their definitions:
(a) Paradox
(b) Analogy
A statement that seems contradictory but may be true in a specific context.
A comparison between two things that highlights their similarities.

- **Long Method:** Analyze the definitions. A paradox is a seemingly contradictory statement (1). An analogy highlights similarities between things (2).

- **Short Method (Tips and Tricks):** Match keywords. "Contradictory" suggests a paradox (1), while "similarities" points to an analogy (2).

Q31. Ethics: You see someone struggling to carry groceries. What is the ethical thing to do?

- **Long Method:** Ethical behavior involves helping those in need.

- **Short Method (Tips and Tricks):** Apply the golden rule. Offer assistance as you would want

Q32. Assumptions: The fire alarm is ringing. We can assume that:
(a) There is a fire.
(b) The alarm system is malfunctioning.

- **Long Method:** Analyze the statement. A fire alarm ringing suggests there might be a fire (a). However, it's also possible the alarm is malfunctioning (b).

- **Short Method (Tips and Tricks):** Identify the most likely implication, but consider alternatives. A fire is the intended purpose of the alarm (a), but a malfunction is also a possibility (b).

Q33. Argument Evaluation: Studying for exams will help you get good grades. Therefore, everyone who gets good grades must have studied hard. Is this argument strong?

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- **Long Method:** Analyze the argument structure. Studying can help with good grades, but other factors might also play a role (e.g., natural talent, test-taking skills). The argument commits the fallacy of affirming the consequent.

- **Short Method (Tips and Tricks):** Identify the logical fallacy. Just because someone gets good grades doesn't guarantee they studied hard (fallacy of affirming the consequent).

Q34. Course of Action: You are lost in the woods. What should you do first?
- **Long Method:** Analyze the situation. Your primary concern is safety and finding your way out. You should stay put and try to signal for help (e.g., call for help, build a fire).

- **Short Method (Tips and Tricks):** Prioritize based on urgency. Staying put and signaling for help is safer than wandering further.

Q35. Statement 1: All planets in our solar system orbit the sun. Statement 2: Pluto is a dwarf planet. Conclusion: Pluto does not orbit the sun. (True or False)
Long Method: Analyze the statements. Statement 1 is a universal affirmative ("All planets...orbit the sun"). Statement 2 identifies Pluto as a dwarf planet, not necessarily relevant to its orbit. However, we need to consider the definition of a "planet" in our solar system, which typically includes orbiting the sun.

Short Method (Tips and Tricks): Identify the relationship between the terms. If Pluto is classified as a dwarf planet and planets typically orbit the sun, the conclusion might be true.

Q36. Course of Action: You left your oven on at home, but you are already at work. What should you do first?
Long Method: Analyze the situation. An unattended oven can be a fire hazard. You should call someone at home to check on the oven or ask a neighbor to help.

Short Method (Tips and Tricks): Prioritize based on urgency. Contact someone to check on the oven to prevent a potential fire.