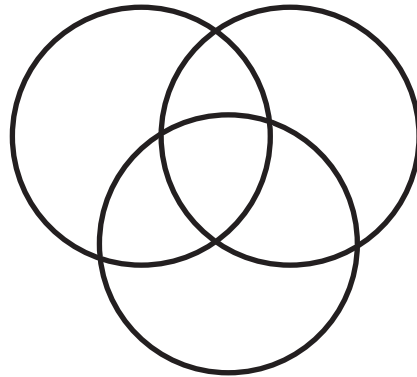


CRITICAL THINKING & LOGICAL REASONING WORKBOOK



**An Essential
Resource for
Everyone**



**Boost Your
Thinking
Skills**

**Gain cognitive skills in three areas:
Verbal, Analytical, Pictorial**

- Logic • Venn diagrams
- Inferencing using symbols • Arguments
- Positioning • Grouping
- Figure formation • Rule detection
and much more !

Prerequisite for Workbooks 6-10

Second Edition

Useful for: *Students *Parents *Teachers *Others

Ranga Raghuram



GIFT OF LOGIC™

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Certificate of Completion

VERBAL REASONING

CONDITIONAL ARGUMENTS

If conditions are present in the premises, we can make inferences (deductions) based on these conditions. From now on, premises in an argument are represented by letters P, Q, R, etc. Recall that the logical operator “if” is represented symbolically using the symbol \rightarrow .

Conditional premise: If P then Q

Symbolic: $P \rightarrow Q$

P (antecedent) \rightarrow Q (consequent)

The operand P on the left side is called the antecedent or sufficient condition or hypothesis. The operand Q on the right side is called the consequent or necessary condition or conclusion. You must learn to represent conditional statements in symbolic form.

Premise: If Jack goes to the movie, then Jill will go to the movie.

Symbolic: Jack goes to movie \rightarrow Jill goes to movie

Since we know that the context of this premise is “going to the movie”, we could also write this statement in a shorter symbolic form as:

Jack \rightarrow Jill. It does not matter how descriptive we are to describe the antecedent and the consequent. What matters is that antecedent and the consequent are accurately identified and understood.

Please refer to workbook# 3,4 and 5 for a rudimentary treatment of conditional, categorical and causal statements and their representation in symbolic form.

Draw a Venn diagram to verify that the following categorical argument is valid.

All P are Q.

All Q are R.

Therefore, All P are R

Draw a Venn diagram to verify that the following categorical argument is invalid.

No P are Q.

No Q are R.

Therefore, no P are R.

Cause and effect can be represented in symbolic as follows: $c \rightarrow$.

Causal Statement: P causes Q

Symbolic Representation: $P \ c \rightarrow \ Q$

The symbol $c \rightarrow$ is used to represent causality. If P represents the cause and Q represents the effect, then the causal relationship is represented by $P \ c \rightarrow \ Q$. Note that the cause happens first and the effect happens after the cause.

When several events have a cause and effect relationship among themselves, we can make certain inferences from these relationships.

1) Reverse causal inference is incorrect.

If P causes Q, then we cannot infer that Q causes P.

$P \ c \rightarrow \ Q$

$\therefore Q \ c \rightarrow \ P$ is an incorrect causal inference.

P occurred first and caused Q to occur later. Not the other way around. The timing of the cause and effect are important. The cause happens first, followed by the effect.

ANALYTIC REASONING

SAMPLE POSITIONING PROBLEM

SCENARIO

Rudy, Puppy, Tommy and Tony are four dogs that need to be seated in four consecutive spots, numbered 1,2,3 and 4. Rudy must always sit in the third spot. Tommy and Tony must always sit in consecutive positions.

QUESTIONS

1) In which of the following positions can Puppy be seated?

A)first B)second C)third D)fourth

2) Which of the following is always true?

- A) Puppy always sits in the fourth position.
- B) Tony always sits in the first position.
- C) Tommy always sits in the second position.

SOLUTION TO SAMPLE POSITIONING PROBLEM

When solving analytic problems like this, we follow a three step process.

- 1) Represent the scenario using symbolic diagrams.
- 2) Assign objects to positions based on the rules.
- 3) Answer the questions.

We start off by using short names for the dogs - R, P, T and Y -- since Tommy and Tony both start with T, to avoid confusion, we use T for Tommy and Y for Tony. Then we represent the rules in symbolic form.

Rudy must always sit in the third spot” is represented as R3 .

Tommy and Tony must always sit in consecutive positions is represented as TY $\#$ YT. We use the symbol $\#$ for exclusive OR here because only one of the possibilities is acceptable.

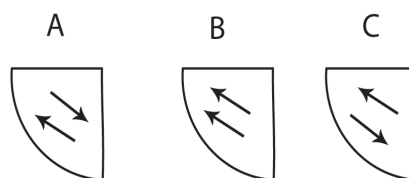
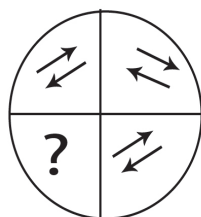
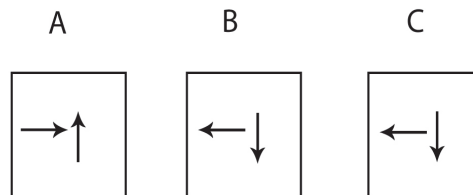
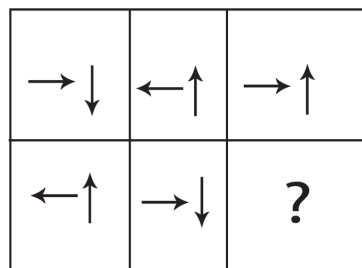
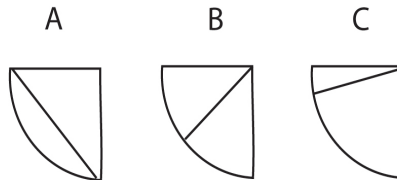
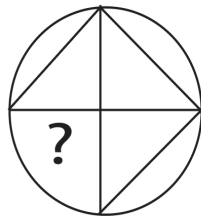
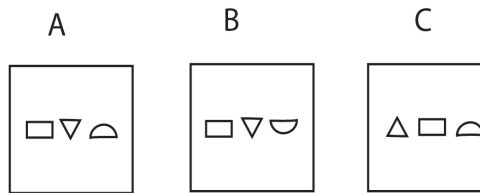
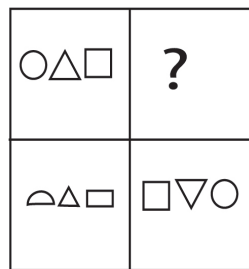
We then write the positions and their occupants in a table and write all the rules on the left of the table. We then assign objects to positions to the extent possible. We place R (Rudy) in the third position to satisfy the rule R3.

R,P,T,Y	1	2	3	4
R3			R	
TY $\#$ YT				

PICTORIAL REASONING

PATTERN PERCEPTION - MISSING PATTERN

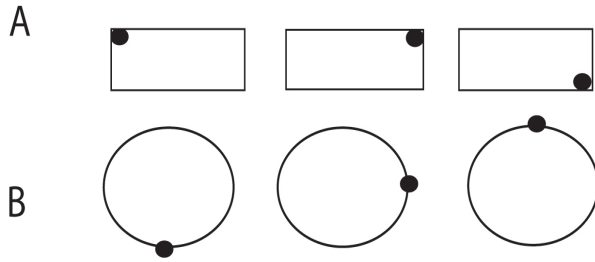
Find the correct figure from the three alternatives given that will fit logically into the missing portion of the figure on the left.



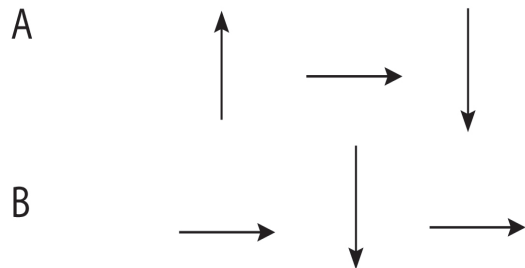
RULE DETECTION

Read the given rule in each question. Then, find the correct choice from the alternatives given that satisfies the rule.

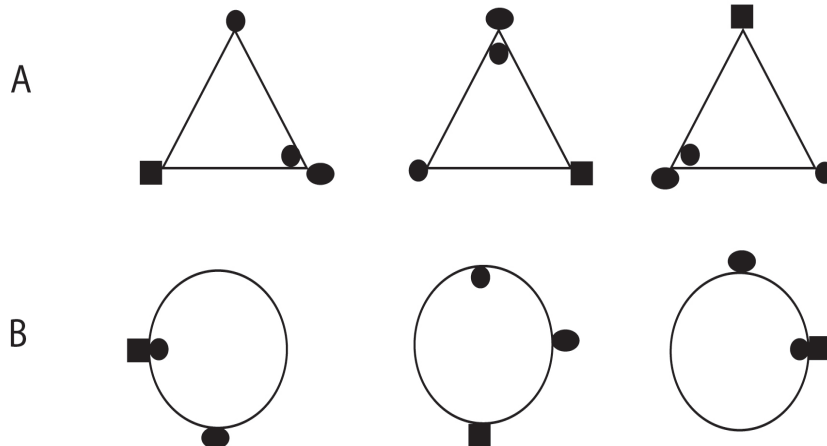
The shaded circle moves clockwise



The arrows rotate clockwise

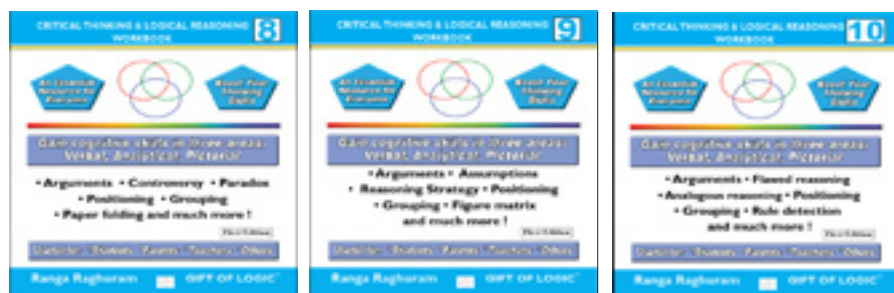
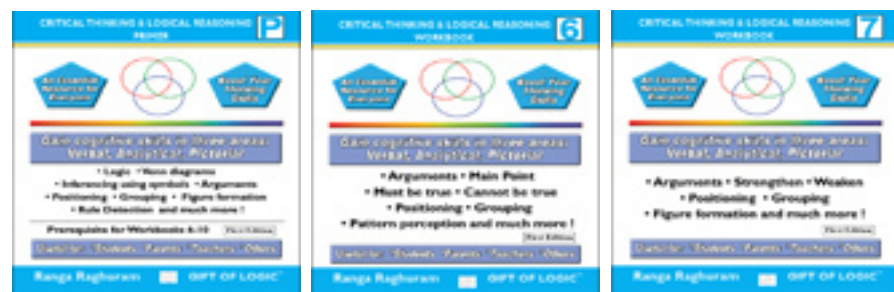
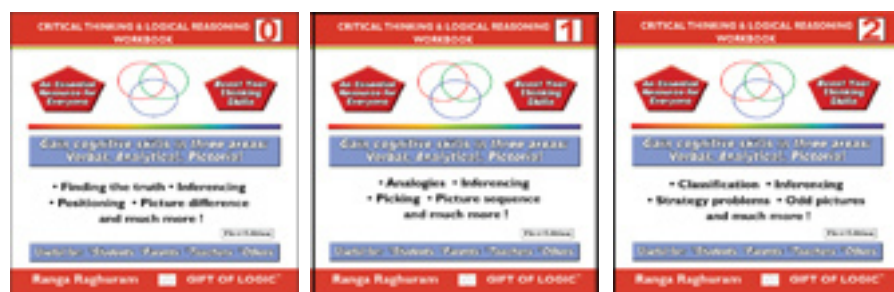


The outside figures move anticlockwise and the inside figures move clockwise



CRITICAL THINKING & LOGICAL REASONING SERIES

12-WORKBOOK CURRICULUM



Reading Plan for school students

Grades	Workbooks
K-2	0,1,2
3-5	0,1,2,3,4,5
6-12	0,1,2,3,4,5 Primer 6,7,8,9,10

Reading Plan for all others

Schedule	Workbooks
First round	0,1,2
Second round	3,4,5
Third round	Primer 6,7,8,9,10

* Primer is a prerequisite for Workbooks 6-10 only.

Please visit <http://www.giftoflogic.com> for more information.

CRITICAL THINKING & LOGICAL REASONING SERIES

- * Boost your Critical thinking and Logical reasoning skills.
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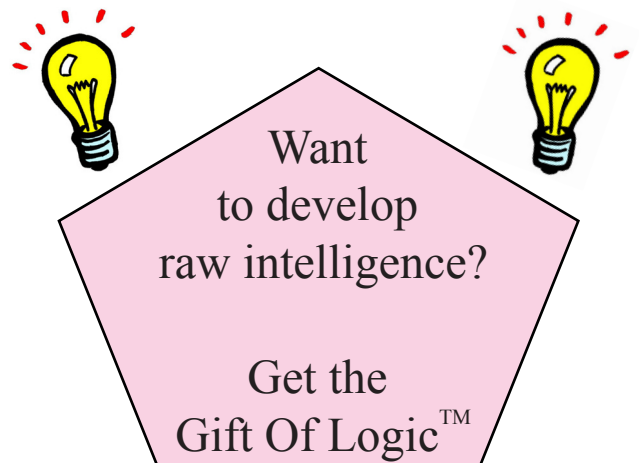
CRITICAL THINKING SERIES HIGHLIGHTS		
Verbal	Analytical	Pictorial
Symbolic Logic	Symbolic Logic	Connect the dots, Mazes
Classification	Positioning	Sudoku
Analogies	Grouping	Picture Sequence
Agree/Disagree	Venn diagrams	Picture Analogy
Logical Operators	Correlation	Odd Picture
Conditional Inferencing	Scheduling	Pattern matching
Categorical Inferencing	Sequencing	Figure formation
Causal Inferencing	Strategy	Paper folding
Arguments	Graph logic	Figure matrix
* Problem solving * Variety of topics * Essential for all		

Reading Plan for school students

Grades	Workbooks
K-2	0,1,2
3-5	0,1,2,3,4,5
6-12	0,1,2,3,4,5 CT & LR Primer 6,7,8,9,10

Reading Plan for all others

Schedule	Workbooks
First round	0,1,2
Second round	3,4,5
Third round	CT & LR Primer 6,7,8,9,10



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