Computational Thinking

Class 3

Student Handbook

CENTRAL BOARD OF SECONDARY EDUCATION

First Edition: March, 2026

Country of Publication: India

Published by: Central Board of Secondary Education, Integrated Office, Sector 23, Dwarka, New Delhi-110077

PREFACE

The National Education Policy (NEP) aims to position India as a leader in emerging knowledge fields by integrating technologies like AI, Machine Learning, Big Data, and Computational Thinking into school education. It promotes technology-enabled, interactive, and gamified learning using tools such as Augmented Reality (AR), Virtual Reality (VR), and virtual labs to foster creativity, problem-solving, and interdisciplinary exploration. NCFSE 23 carries this recommendation further for implementation.

While Artificial Intelligence (AI) is an important requirement, Computational Thinking (CT) should be a broader skill, developing a foundation for learning AI. It can cover various aspects like Cybersecurity, basic network, etc. Hence, CBSE approaches this by integrating Computational Thinking with AI and other technological advancements, without dependence on any platform.

The book introduces foundational Computational Thinking skills through simple, visual, and observation-based problems involving numbers, shapes, pictures, and everyday situations. It focuses on recognising basic patterns, understanding simple sequences, identifying similarities and differences, and following step-by-step instructions. The document also provides age-appropriate pedagogical approaches, learning resources, assessment support, and classroom implementation guidelines to ensure joyful, inclusive, and skill-based learning, in alignment with NEP 2020.

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Introduction

Computational Thinking (CT) is a problem-solving approach that comprises Decomposition, Pattern Recognition, Abstraction, Algorithm Design, Data Analysis and Troubleshooting. Computational Thinking Skills involve solving complex problems that promote thinking skills such as critical & creative thinking, abstraction and pattern recognition, as well as algorithmic thinking. Problem identification and problem solving necessitate the application of multidisciplinary understanding for creating effective solutions.

Artificial intelligence (AI) is a cutting-edge technology that empowers machines and computers to perform tasks that usually require mimicking human intelligence. These machines can perform complex thinking processes such as data analysis, pattern recognition, prediction of trends, solving problems and decision making. Thus, AI involves simulating cognitive processes associated with human intelligence and is widely applicable in various sectors such as banking, healthcare, defense, education, entertainment, agriculture and others for processing information, solving intricate problems and for planning.

The National Education Policy (NEP) aims for India to emerge as a global leader in new emerging knowledge domains such as artificial intelligence, machine learning, data analytics, 3-D machining etc. To realise this goal, the policy suggests teaching students Mathematics and Computational Thinking, along with new subjects like Artificial Intelligence, Machine Learning, and Data Science during their school education. The policy also focuses on technology-enabled learning and classrooms by using tools like artificial intelligence, machine learning, and adaptive testing to create knowledge.

The National Curriculum for School Education draws from this policy aspiration and emphasizes the need to introduce these emerging domains of study and technologies in the school curriculum. It recommends inclusion of subjects such as design thinking, augmented reality, virtual reality, artificial intelligence, and computational thinking. Additionally, it promotes the use of gamified content, interactive content, and immersive experiences (such as AR, VR, or virtual labs) to enhance student learning. In a variety of subjects, including design, music, art, and sciences, these resources support students in knowledge creation and exploration, and development of capacities such as problem-solving, critical and creative thinking.

CBSE, under the aegis of the Department of School Education and Literacy, Ministry of Education, Govt. of India, is implementing a Curriculum on Computational Thinking and Artificial Intelligence (CT & AI) to inculcate AI-readiness in school students. This curriculum will be implemented from classes 3rd to 8th, in the session 2026-27, and aims to develop AI-Ready learners, by focusing on Computational Thinking Skills. The AI-readiness, so inculcated through CT Skills, will help develop the capacities of learners to use computational thinking, such as logical thinking, problem solving, pattern recognition, and so on, and understand the role and use of Artificial Intelligence in daily life. The Curriculum aims to build strong foundations in computational thinking, digital literacy, and responsible use of technology, along with nurturing innovation, critical thinking, and ethical decision-making capacities.

1. Relevance: Importance of Introducing Computational Thinking (CT)

Introducing CT at the Grade 3 level is essential as it serves as the **intellectual backbone** for future digital literacy and AI readiness.

- **Foundation for AI:** CT develops the reasoning processes—such as breaking problems into parts and spotting patterns—that power modern technology and Artificial Intelligence
- **Cognitive Development:** It fosters essential human capacities, including logical thinking, problem-solving, pattern recognition, and ethical decision-making
- **Real-World Application:** It equips students to approach daily-life challenges systematically, transforming them into informed and creative digital citizens

2. Objectives (Curricular Goals)

For the Preparatory Stage (Classes 3–5), the curriculum defines three primary curricular goals:

- **CG-1:** Develop basic problem-solving skills with procedural fluency to solve daily-life problems as a step toward formal computational thinking
- **CG-2:** Develop basic capacities of analytical thinking, verbal, and visual reasoning.
- **CG-3:** Demonstrate understanding of basic concepts of computers and knowledge of hardware and software.

3. Learning Outcomes

ABSTRACT THINKING

Students will be able to solve problems with hidden or unseen ideas, using:

- Different viewpoints of 3D objects
- Changes in shapes after flips, turns, folds, or rotations
- Hidden or missing parts in incomplete shapes or patterns

PATTERN RECOGNITION

Students will be able to identify simple patterns involving 1 or 2 changes in consecutive terms, formed using:

- Numbers
- Shapes or images
- Letters
- Or a mix of the above

DECOMPOSITION

Students will be able to break down problems involving 2–3 clues, using information from:

- Number clues or number names
- 3D objects and their parts (faces, edges, corners)
- Step-by-step exchanges or transfers (money, objects, digits)
- Tables or charts with multiple pieces of information

ALGORITHMIC THINKING

Students will be able to follow clear step-by-step rules to solve problems involving:

- Number sequences formed using simple operations
- Movements on grids or direction-based paths
- Events arranged using before/after/in-between clues
- Values that increase or decrease across steps

- Multi-step instructions involving moves, changes, or transfers

4. Mapped with NEP and NCF 2023

The curriculum is directly aligned with the vision of the **National Education Policy (NEP) 2020** and the **National Curriculum Framework for School Education (NCF-SE) 2023**.

- **Integrated Learning:** Following NCF-SE guidelines, CT is not treated as an isolated subject but is integrated into Mathematics and "The World Around Us" (TWAU) to promote a multidisciplinary understanding
- **Competency-Based:** The learning standards are derived from the Aims of School Education defined in the NCF, moving from general capacities to specific classroom learning outcomes

5. Time Allocation

- **Annual Hours:** A total of 50 hours annually is suggested for the Preparatory Stage (Classes 3-5)
- **Integration:** This time is embedded within the existing periods for Mathematics and TWAU to ensure students are not overburdened with additional content load

6. Approach / Pedagogy

The pedagogical approach for Grade 3 is designed to be playful and experiential:

- **Activity-Based:** Learning is driven by fun math games, puzzles, and hands-on exercises rather than rote memorization
- **Resource Integration:** Teachers use specialized CT workbooks and resource books that add CT-focused questions to existing chapters in the standard textbooks
- **Collaborative Learning:** The curriculum encourages peer discussions and group tasks to solve problems organized through worksheets

7. Assessment

Assessment for Grade 3 shifts away from traditional testing toward continuous and formative methods:

- **Specific Tools:** Assessment methods include written tests involving puzzles, interactive group activities, and the use of a Teacher Observation Journal to track student progress
- **Focus:** The goal is to assess the student's ability to apply knowledge and think creatively rather than their ability to recall facts

How to Use This Book?

This book is designed as a companion to the Mathematics textbook and is intended to be used alongside regular classroom teaching. Since it follows the same chapter sequence, the Mathematics teacher can seamlessly integrate it into daily instruction. As concepts are introduced in class, the corresponding questions from this book can be used to deepen understanding and encourage application.

Before beginning a chapter, the teacher is encouraged to go through the content of this book, identify the underlying concepts required for each question, and plan how to align them with classroom teaching. As these concepts are taught, the teacher can introduce the related thinking questions to students.

It is important to note that the questions in this book are thinking-based and designed to promote analysis, reasoning, and problem-solving. Teachers should adopt a facilitative approach, guiding students through prompts and discussions rather than directly providing solutions. Students should be given time to think and attempt independently, followed by classroom discussions where different approaches are shared and explored.

Some chapters also include activities that build intuition and engagement. These should be conducted before attempting the questions, as they help students approach the problems with better understanding.

Teachers should approach this book with the mindset that the process of thinking is more important than arriving at the correct answer. Creating a safe and encouraging environment where students feel comfortable making mistakes, exploring multiple strategies, and expressing their reasoning is essential. The goal is to nurture confident, independent thinkers rather than focus solely on correctness.

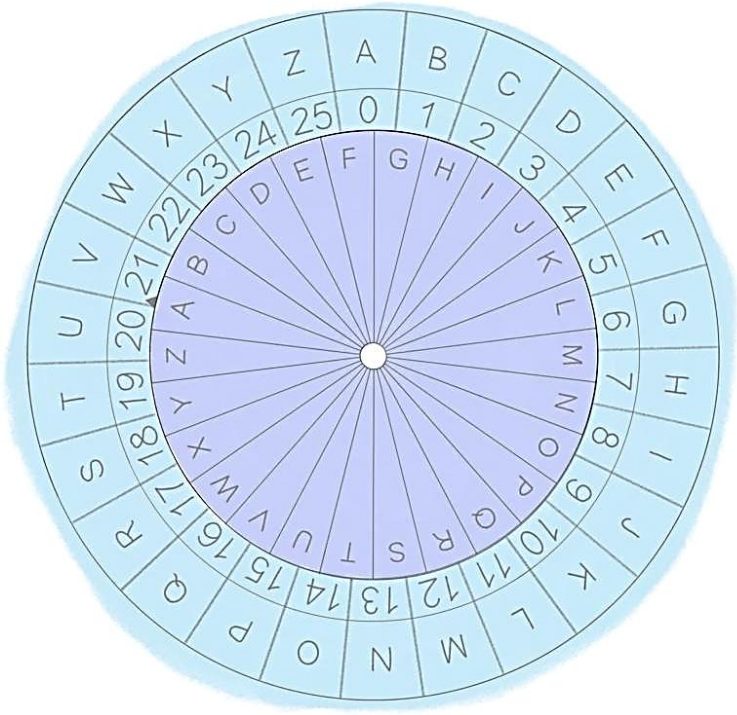
Chapter 1: What's in a Name?

Activity Time

Activity: Caesar Cipher

People have used secret messages for centuries to protect important information. Even today, much of our communication online needs to be encrypted to keep our private data safe. For example, when your parents withdraw money from an ATM or make a UPI payment, they enter a PIN. This number needs to be hidden so that no one else can take their money, or when your parents buy something online and enter their bank card details, the information needs to be protected so others cannot see or steal it.

A secret is information shared only with someone you completely trust through a message. Encryption is the process of changing a message so that its original meaning is hidden from anyone except the intended receiver. Though today we use sophisticated methods to encrypt information, here we will understand encryption using a simple activity.



One simple way to do this is through ciphers. Cipher scrambles up the message using a **key**. For you to unscramble and access the message, you must have the key. This way the cipher protects your message from those who do not have the key.

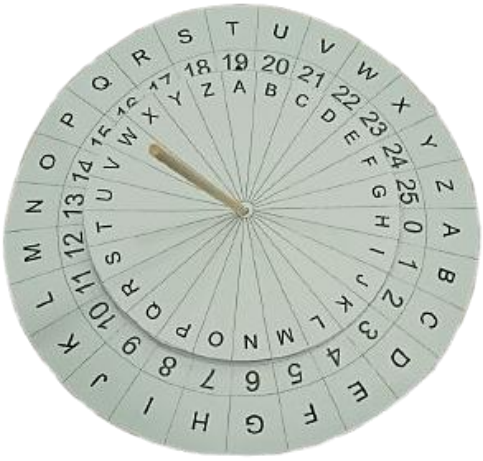
A well-known example of a cipher is the **Caesar Cipher**, named after the Roman leader Julius Caesar. He used this method to send important messages securely. In the Caesar Cipher, the letters of the alphabet are shifted by a certain number of places to be replaced by a new alphabet.

For example, if the alphabet is shifted one place, A becomes B, B becomes C, and so on, while Z comes around to become A. This simple shifting method allows messages to be hidden from anyone who does not know the key, the shift number.

1. **Complete the table below by shifting the alphabet.**

Original Placement	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Shift 1 place																										
Shift 2 place																										
Shift 20 place																										

Cut out both the two circles, and carefully cut out the arrow on the smaller circle, it will help as an indicator. Put a toothpick or a thin stick through the centre of the two circles, with the smaller one on top of the larger one. Make sure that the small circle is free to rotate over the bigger circle.



2. **If the message "CAESAR CIPHER" is encoded with a shift of 3 places, which of the following is the correct encoded message?**

a) ECGUCT EKRJGT b) FDHVDU FLSKHU c) GEIWEV GMTLIV d) DBFTBS DJQIFS

Activity: Encrypting messages through Caesar Cipher

Choose a short message, like your name, your school name or the food item in your lunchbox that you would like to give to your friend, and decide on a number that will represent the shift. To use the cipher, first align the 'A' on the smaller circle with 'A' on the bigger circle. Now, turn the smaller circle such that the arrow lies on the chosen shift number.

Now, to encode (encrypt) your message, look for each letter of your message on the smaller circle, and write down the matching letter from the bigger circle. Do this one letter at a time until the entire message is encoded.

Once you have finished encoding your message, give your friend the encoded message and the shift letter (key). To decode (decrypt) the message, your friend should rotate the smaller circle so that the arrow matches the given key. Then your friend finds each letter of the encrypted message from the bigger circle and writes the corresponding letter on the smaller circle to reveal the original message.

3. **If the message "THIS MESSAGE IS HIDDEN" is encoded as "ESTD XPDDLRP TD STOOPY", by how many positions has the alphabet been shifted?**

   a) 5 b) 11 c) 17 d) 7

---

4. **How many possible meaningful ways are there to shift the alphabet in a Caesar cipher?**

   a) 26 b) 52 c) 25 d) 50

Think about how secure the Caesar Cipher really is by exploring that there are only a few possible shifts. This helps to understand that some methods work, but may not always be strong enough for real security. This may work for your secret messages to your friends, but not for your parents' bank transactions.

Questions

1. **Find the largest number name that is hidden in the series given below.**
   Note: *The letters in the number name should appear together as continuous letters*
   FORHLKJLTEMELEVENDSKLFOURSDGSTWENTYSJLSIXTKSEVENL
   a) 60 b) 6 c) 20 d) 70

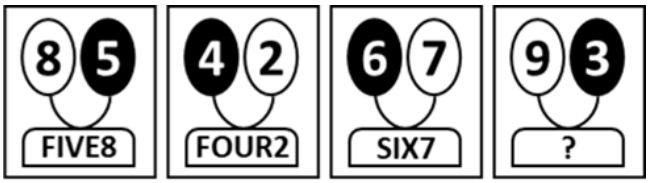
---

2. **Roy's favourite number has:**
   - **3 letters in its name**
   - **The number of vowels is double the number of consonants in its name**

   What is Roy's favourite number?
   a) 2 b) 6 c) 10 d) 1

---

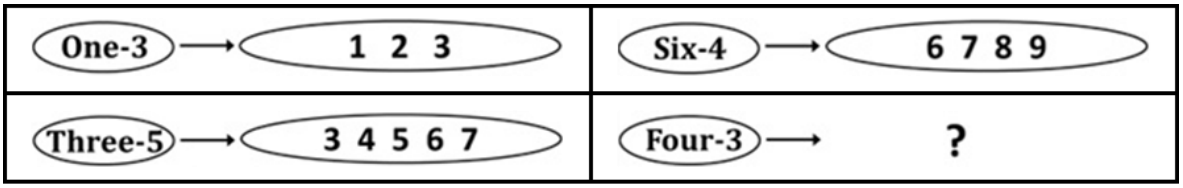
3. **If each of the given boxes follows the same theme, what will come in place of "?"**



   a) NINE3 b) THREE9 c) THREE3 d) 9THREE

---

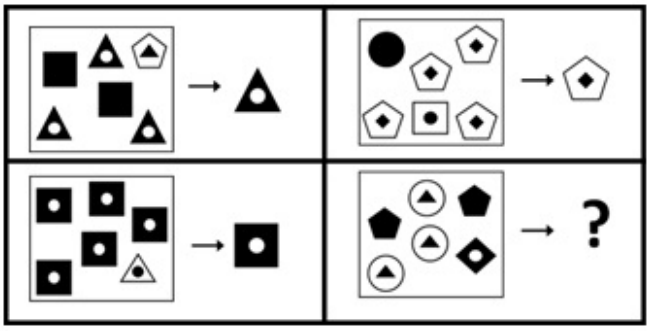
4. **If each of the following terms follows the same theme, what will come in place of "?"**



   a) 4 5 6 7 b) 3 4 5
   c) 4 5 6 d) 3 4 5 6

---

5. **If each of the following terms follows the same theme, what will come in place of "?"**



   a) b) c) d)

6. Find the odd one out.

a) 

b) 

c) 

d) 

---

7. Which of the following number names given in the options will come second if arranged in dictionary order of their names?

a) 5 b) 6 c) 8 d) 9

---

8. Each shape has a letter in it. Spelling (or Name) of which of the following numbers, given in the options can be formed by combining the letters in the circles only?

a) 1 b) 5 c) 9 d) 6

---

9. Spelling of which of the following numbers given in the options is present in the group of letters given below?

Note: *The letters of the name should appear in the same order as in the word*

TWLVETOWELEVENSVENTHREEIFEIHGT

a) 2 b) 7 c) 3 d) 8

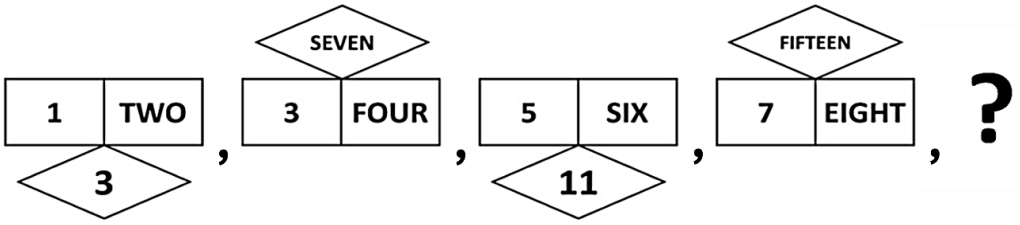
---

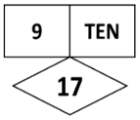
10. Which of the following numbers CANNOT be spelt using the letters present in the image given below?

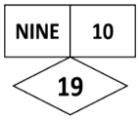
Note: *If a letter appears in the image, it can be repeatedly used any number of times to spell the number name*

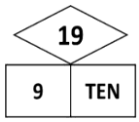
a) 50 b) 30 c) 85 d) 11

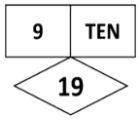
11. What will come in place of "?" in the given series?



a) 

b) 

c) 

d) 

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12. If you were to write the numbers given below in words, spelling of which of them would have exactly one vowel in it?

a) 1 b) 2 c) 5 d) 9

---

13. X is a single digit number. If X has exactly five letters in its spelling, how many different values can X possibly have?

Note: *If a letter is repeated in the spelling of X, it has to be counted as many times as it appears in the spelling. For example, the word "NINE" has 4 letters and not 3 letters*

a) 1 b) 2 c) 3 d) 4

The Thinking Spot

Raj, Aryan, and Rahul went to a movie on different days.
Raj did not go to the movie on Monday, Wednesday, or Thursday.
Aryan went to the movie on Friday, and Rahul went to the movie on Sunday.
Which of the following days could Raj have gone to the movie?

(a) Thursday

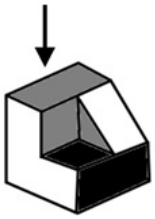
(b) Tuesday

(c) Saturday

(d) Either Tuesday or Saturday

Chapter 2: Toy Joy

1. **Which of the following options represents the top view of the object given below?**



a)  b)  c)  d) 

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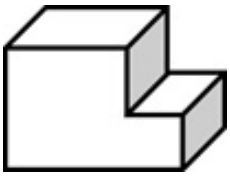
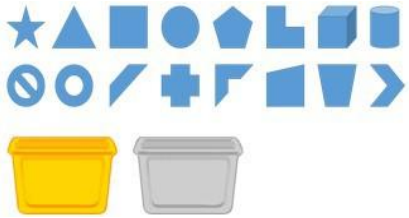
2. **Count the number of surfaces (faces) in the given solid.**



a) 6 b) 7 c) 8 d) 9

---

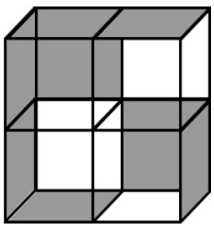
3. **The given shapes are to be placed in the buckets. Shapes with a number of edges greater than 5 are kept in a yellow bucket while the others are kept in the white bucket. Out of the shapes in the yellow bucket, how many have EXACTLY 6 edges?**

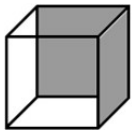
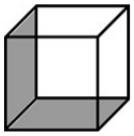
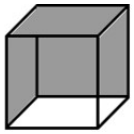
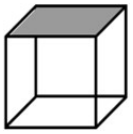


a) 2 b) 3 c) 4 d) 5

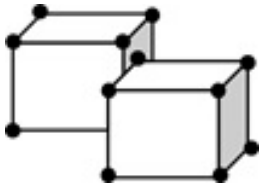
---

4. **Given below is a large box consisting of four smaller transparent boxes with some sides coloured. Which of the boxes shown in the options is not a part of the larger box in the question image?**
Note: *Rotation of option images is not allowed*



a)  b)  c)  d) 

5. If there is a dot on each corner of the cubes below, then how many dots are hidden?



a) 3 b) 4 c) 5 d) 6

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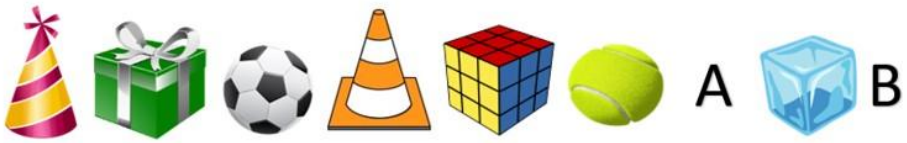
6. What will come in place of 'A' and 'B'?

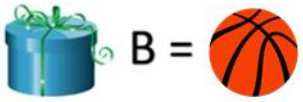


a) A = B =

b) A = B =

c) A = B =

d) A = B =



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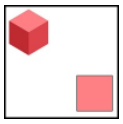
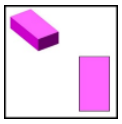
7. Find the odd one out.

a)

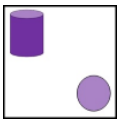


b)

c)



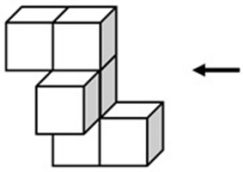
d)



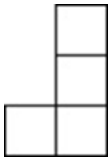
---

8. If the given solid is viewed from the direction of the arrow, what will it look like?

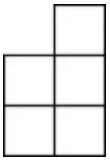
Note: *You cannot rotate the question or option images*



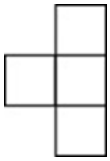
a)



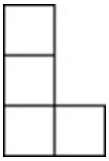
b)



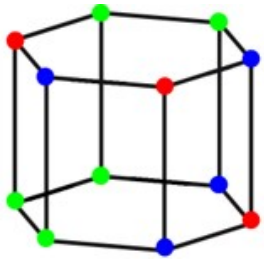
c)



d)



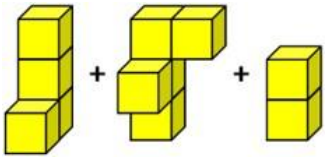
9. How many edges of the solid shown below have the same-coloured dots on both of their corners?

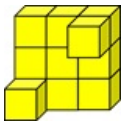
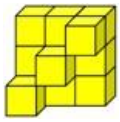
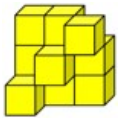
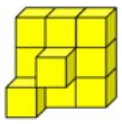


a) 2 b) 3 c) 4 d) 5

---

10. Which of the following options can be formed by combining the shapes given below?



a)  b)  c)  d) 

The Thinking Spot

Two friends A and B play a game of tennis with 5 sets. No set can end in a draw. Anyone who wins 3 or more sets will win the game. A won set 1, B won sets 2 and 3. If B did not lose any EVEN NUMBERED set, who won the tennis game?

(a) A

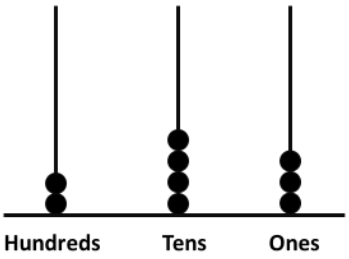
(b) B

(c) Game ended in a tie

(d) Cannot be Determined

Chapter 3: Double Century

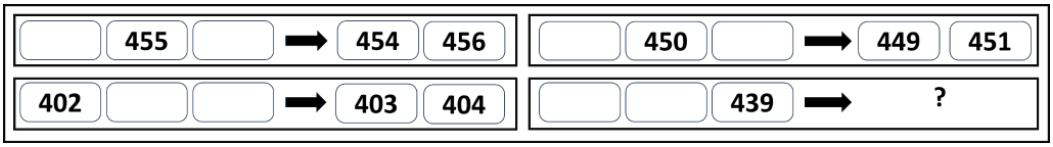
1. **At minimum, how many more beads are required to show number 496 on the given abacus?**



a) 487 b) 253 c) 10 d) 11

---

2. **If each of the following terms follows the same theme, what will come in place of "?"**



a) 438 440

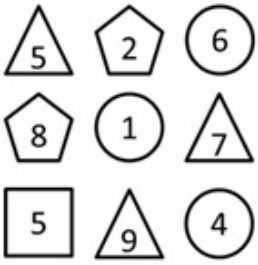
b) 440 441

c) 438 437

d) 437 438

---

3. **Each shape has a digit in it. Which of the following numbers in the options can be formed by using the digits in the CIRCLES only?**



a) 615 b) 142 c) 467 d) 146

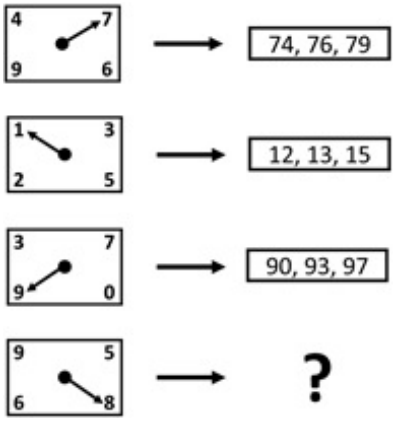
---

4. **How many numbers will remain after Sam cancels all numbers less than 432 and all numbers greater than 567 in the set given below?**

451, 430, 568, 411, 392, 517, 533, 578, 420, 525, 566, 616, 571, 436

a) 5 b) 6 c) 7 d) 8

5. What will come in place of "?"



a) 89, 86, 85 b) 85, 86, 89 c) 86, 89, 85 d) 85, 89, 86

---

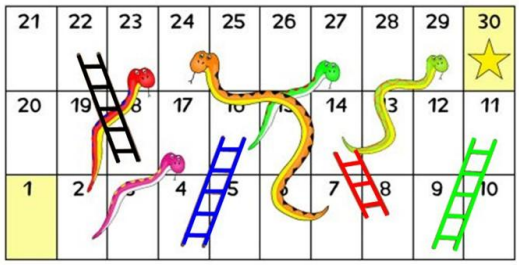
6. If you remove all the numbers greater than 5 from row 1, all the numbers less than 4 from row 2, and all the numbers greater than 7 from row 3, then which row will have the largest count of numbers remaining?

Row 1	8	4	1	7	2	6
Row 2	5	2	7	0	3	1
Row 3	4	6	8	9	5	1

a) Row 1
b) Row 2
c) Row 3
d) Both rows 1 and 3 have equal numbers

---

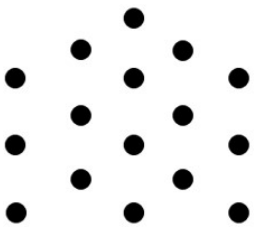
7. Given below is a game board of snakes and ladders. Which ladder is most beneficial?



a) Black b) Blue c) Red d) Green

---

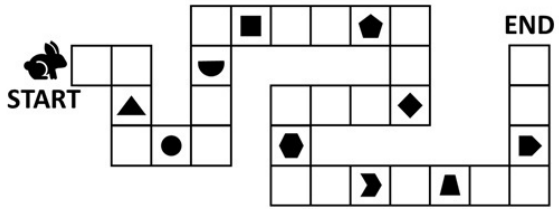
8. In the image given below, what is the maximum number of dots that can be connected by drawing a single straight line?



a) 3 b) 4 c) 5 d) 6

9. The rabbit has to reach the end of the path by stepping on EACH block WITHOUT skipping any blocks in between. It collects an item from every 5th block it steps on. Which of the following objects did it NOT collect?

Note: *The rabbit can step on a block exactly once*



a)  b)  c)  d) 

---

10. Altogether, 25 coins are to be arranged in different stacks in such a way that each stack has one more coin than the previous stack. If the last stack has 7 coins, how many such stacks will be required so that no coins are left?

a) 4 b) 5 c) 6 d) 7

The Thinking Spot

My 4-digit phone passcode is made using only odd numbers, and no number is used more than once. 3 is the smallest digit in the code, and is also the last digit of the code. The largest digit and the smallest digit of the code have only one digit in between them.

What is the hundred's digit (2nd digit from the left) of my phone pass code?

Note: *None of the digits in the pass code are repeated. Each digit appears only once*

(a) 7

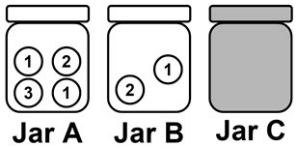
(b) 5

(c) 9

(d) Either option a or c

Chapter 4: Vacation with My Nani Maa

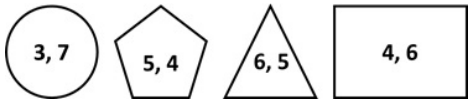
1. **Jars A, B, and C together have 9 balls, with each ball having a number written on it. Each number appears EXACTLY 3 times. What is the sum of the numbers in Jar C?**



a) 8 b) 9 c) 7 d) 6

---

2. **For each shape, if we remove the smallest digit, the difference between the remaining digits of which two shapes will be the LEAST?**



a) 

b) 

c) 

d) 

---

3. **A, B, and C have some amount of money (in rupees) as shown below:**
   A = 50, B = 100, and C = 150
   How much money should B and C together give to A such that each of them ends up with the same amount of money?

a) 15 b) 25 c) 50 d) 75

---

4. **Starting from the left end of a row, there are three kites, followed by two umbrellas, then three balls, and then three bottles in that order. Which item is located 7th from the right end of the given row?**

a) Umbrella b) Kite c) Bottle d) Ball

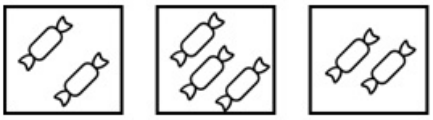
---

5. **Tom (a boy) has 2 brothers. Each of his sisters has 2 sisters. How many children does Tom's mother have?**

a) 7 b) 6 c) 5 d) 4

---

6. **The given boxes have some candies, and if EACH of the given boxes should have EXACTLY 3 candies, then how many MORE candies do we need in total?**



a) 1 b) 2 c) 3 d) 4

7. **A frog is standing on a number line at 0. It jumps on the number line such that in each jump, it moves 4 steps forward but then slips back 2 steps.**
   In how many jumps will the frog reach number 18 for the first time?
   a) 8 b) 9 c) 10 d) 11

---

8. **X, Y, and Z start a game with 100 points each. After each round, the winner takes 10 points from each player. Z won only the fourth round, and they played 5 rounds in total. What is Z's final score? Note:** *No round can end in a draw*
   a) 70 b) 80 c) 90 d) 100

---

9. **Which number will you NEVER get if you add a single digit number and a two-digit number?**
   a) 11 b) 102 c) 105 d) 109

---

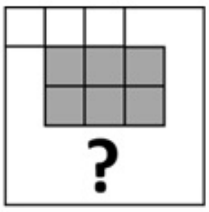
10. **A and B are playing a game, where the winner of every round receives 3 points and 1 point will be reduced from the loser's score. If they start with 10 points each, what could be the MAXIMUM possible difference between their final scores, if they play 5 rounds altogether?**
    a) 20 b) 25 c) 15 d) 10

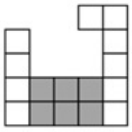
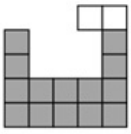
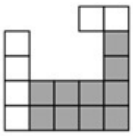
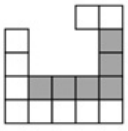
The Thinking Spot

There are 3 identical glasses A, B, and C which are filled equally. Now,
(A) Half of the water in glass A is poured into glass C
(B) Half of the water in glass C is poured into glass B
Which glass has the maximum amount of water?
(a) A
(b) B
(c) C
(d) Either a or c

Chapter 5: Fun with Shapes

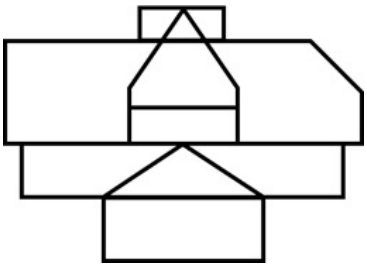
1. **Given below is an incomplete grid. Which option will complete the grid such that ALL the grey boxes TOGETHER form a square?**



a) 
b) 
c) 
d) 

---

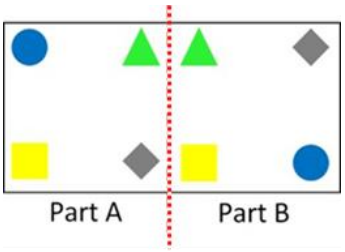
2. **Count the number of rectangles in the given figure.**
Note: *Please count all squares as rectangles for the purpose of this question*



a) 3 b) 4 c) 5 d) 6

---

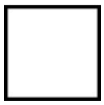
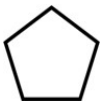
3. **When the sheet is folded along the red dotted line, which two identical shapes will overlap?**



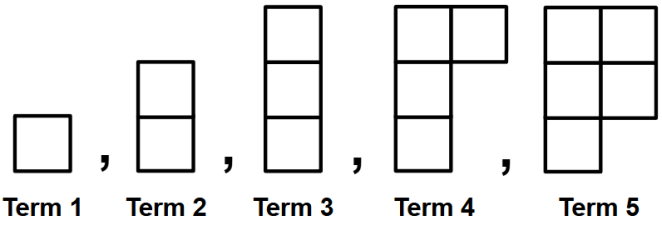
a) Triangle b) Square c) Circle d) Diamond

---

4. **Which of the following shapes CAN NEVER give a 4-sided figure, when folded only once into two equal halves?**

a) 
b) 
c) 
d) 

5. If the boxes keep getting added in the same pattern, then in which term, a complete square (made up of boxes) will be formed?



a) 7 b) 8 c) 9 d) 11

---

6. The given shapes must be arranged to form a square without removing any shape. Which of the following actions are required to do so?

a) All the green shapes must take one left turn

b) All the green shapes must take one right turn

c) All the orange shapes must take one right turn

d) All the orange shapes must take one left turn

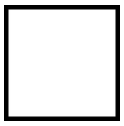
---

7. Which of the following shapes is NOT HIDDEN in the given figure?

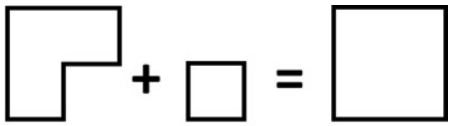
a) 

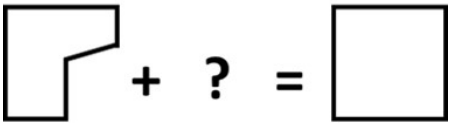
b) 

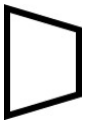
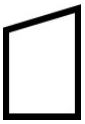
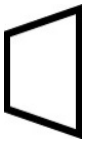
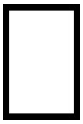
c) 

d) 

8. **What will come in place of "?"**

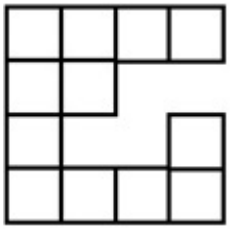


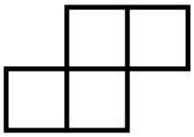
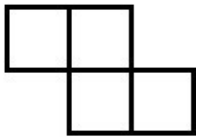
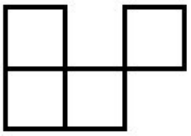
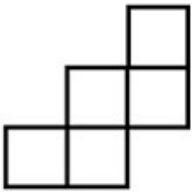


a)  b)  c)  d) 

---

9. **Identify the image which will complete the square grid given below.**
   Note: *You CANNOT rotate the question image or the option images to find the answer*



a)  b)  c)  d) 

---

10. **The figure below is formed of different blocks. Which block appears the MOST number of times in the given figure?**

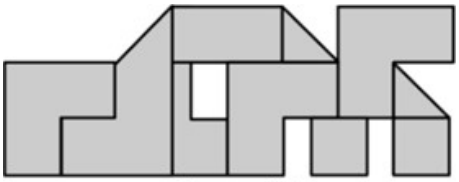
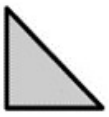


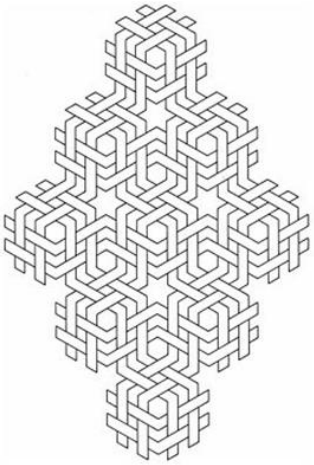
Image X

a)  b) 

c)  d) All of them occur equally

11. How many times is Image X present in the Question Image?

Note: *Rotation of Image X or the Question Image is not allowed*



Question Image

Image X

a) 1 b) 2 c) 4 d) 5

The Thinking Spot

A coach must make 2 teams of two players each from four friends A, B, C, and D such that each player can be in only one team. He needs to follow the following conditions:

a. A cannot team up with B

b. C cannot team up with B

Which of the following is a possible team?

(a) D and A

(b) C and D

(c) C and B

(d) D and B

Chapter 6: House of Hundreds – I

1. **How many 3-digit numbers can you make with only 4 and 5, if one of the digits is present exactly twice?**

   a) 3 b) 5 c) 6 d) 9

---

2. **If the hundreds digits of each of the numbers given below are shifted to the units place, then how many numbers will be less than 150, finally?**

   314, 616, 511, 127, 814, 915, 118, 714

   a) 3 b) 4 c) 5 d) 6

---

3. **What is the difference between the largest and the second largest three-digit numbers formed using the digits 0, 3, and 1 such that no digit is repeated within a number?**

   a) 180 b) 99 c) 9 d) 1

---

4. **Find the odd one out.**
   Note: *It is not related to the number of letters, vowels, or consonants of the words*

   a) Thirty-Two tens and two ones
   b) Three hundreds and Twelve ones
   c) Three hundred and twenty-two
   d) Three hundreds, two tens and two ones

---

5. **In a 3-digit number, the digit in the units place is twice the digit in the hundreds place. What could be the lowest possible value of the sum of the digits?**

   a) 0 b) 3 c) 4 d) 5

---

6. **I am given a number 435. If the first (hundreds) and third (units) digits of this number are interchanged, then the new number will be _____ the original number.**

   a) smaller than b) same as c) greater than d) cannot say

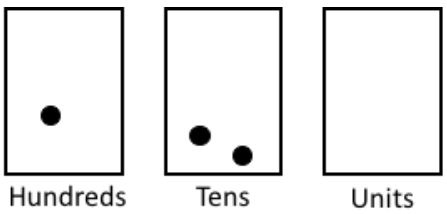
---

7. **Nishit remembers that his friend Shreya's score is more than 160 but less than 190, whereas their friend Nitigya remembers that Shreya's score is more than 170 but less than 200. If Nishit and Nitigya both remember correctly, and the units place of Shreya's score is 0, what is her score?**

   a) 150 b) 160 c) 170 d) 180

---

8. **Lalit has 3 marbles and 3 boxes, where each box represents a place value, as labelled.**
   He places the marbles into the boxes to form a number.
   For example, in the image shown below, the number 120 is formed.
   How many different numbers can Lalit form if he uses all 3 marbles every time to make a number?



   a) 6 b) 9 c) 10 d) 11

9. In a 3-digit number, the digit at the units place represents the total number of 0's this number has. Which of the following must be the digit at the unit's place in this number?

a) 0 b) 1 c) 2 d) 3

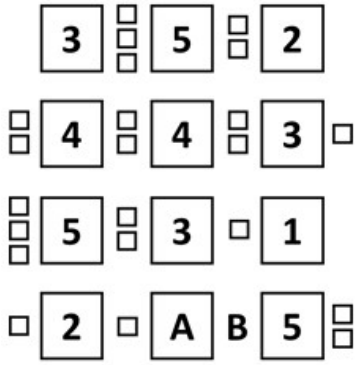
---

10. If P and Q are two 3-digit numbers, then which of the following CANNOT be the difference of P and Q?

a) 950 b) 150 c) 300 d) 750

The Thinking Spot

If every row follows the same theme, what will come in the place of "A" and "B"?



(a) A = 3 , B =

(b) A = 3 , B =

(c) A = 4 , B =

(d) A = 4 , B =

Chapter 7: Raksha Bandhan

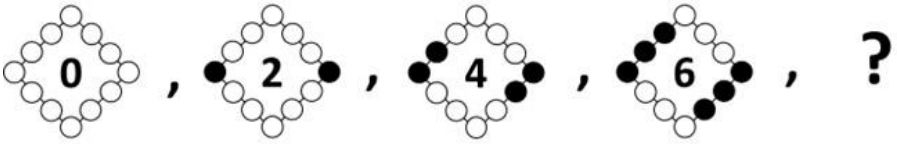
1. **Every class that visits the National Museum is divided into groups of 6 students for each tour guide. Among the given options, which of the classes would not be able to form groups of 6 students with none left over?**

   Note: *The number in the option is the number of students in that class*

   a) 36 b) 42 c) 38 d) 48

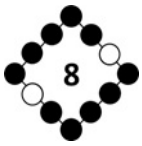
---

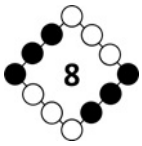
2. **What will come in place of "?" in the given series?**



a) 

b) 

c) 

d) 

---

3. **I have to distribute a few sweets. If I keep 2, 3, or 4 sweets in a pack, then I am left with one sweet after all packs are made. But if I put 5 sweets in a pack, I am left with none. What is the MINIMUM number of sweets I have?**

   Note: *I have more than one pack*

   a) 25 b) 50 c) 54 d) 55

---

4. **Which of the following statements is/are necessarily required to answer the question below?**

   Question: Which number am I?

   Statement 1: I am not an even number.

   Statement 2: If you multiply any number with me then the answer is the same as the number which was multiplied with me.

   a) Only statement 1 is required

   b) Only statement 2 is required

   c) Both statements 1 and 2 are required

   d) Cannot be answered even if we use both the statements together

---

5. **PQ and RS are 2-digit numbers in the equation given below. How many different possible values can "RS" have?**

$$RS = 4 \times PQ$$

   a) 12 b) 13 c) 14 d) 15

---

6. **Reema put 10 x 7 plastic cups in the first stack, 10 x 8 plastic cups in the second stack, and 10 x 9 plastic cups in the third stack. If this pattern continues, how many plastic cups will Reema put in the fifth stack?**

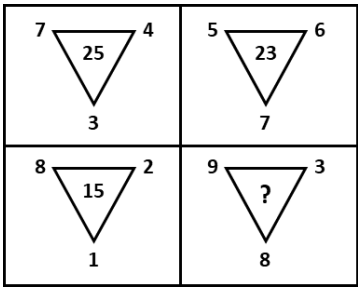
   a) 100 b) 108 c) 110 d) None of these

7. **I have some toys. If I take 2 times the number of toys with me and divide them equally into groups of 30, then 3 groups will be formed. What is the number of toys I have?**

a) 5 b) 20 c) 45 d) 180

---

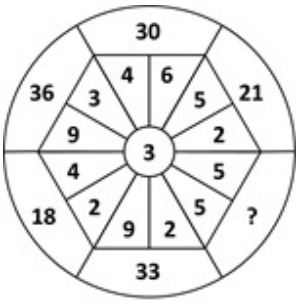
8. **If all the given triangles follow the same pattern, what will come in place of "?"**



a) 15 b) 19 c) 32 d) 17

---

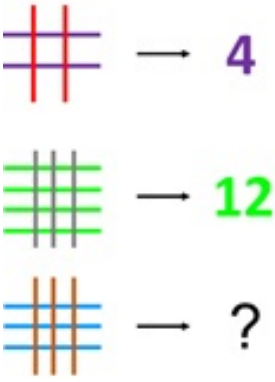
9. **What will come in place of "?"**



a) 24 b) 30 c) 25 d) 15

---

10. **What will come in place of "?"**



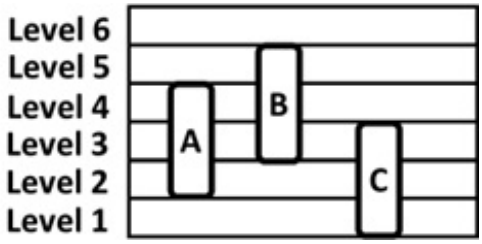
a) 6 b) 9 c) 9 d) 6

The Thinking Spot

There are 3 rods A, B, and C placed at different levels as shown below.

- **Rod A moves 1 level up**
- **Rod B moves 2 levels down**
- **Rod C moves 2 levels up**

HOW MANY levels are COMMON between ALL three rods?



(a) 0

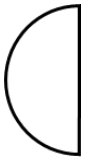
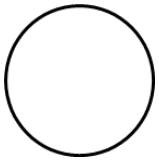
(b) 1

(c) 2

(d) 3

Chapter 8: Fair Share

1. **A piece of paper was folded in half to get a semicircle. What was the original shape before the fold?**

a)  b)  c)  d) 

---

2. **If the alphabets are divided into two equal halves - from A to M and N to Z, which letter in the other half would be in the same position as the letter J?**

a) Q b) V c) X d) W

---

3. **3 people A, B, and C have to cover a distance of 12 m each. A has covered half the distance. B has covered half the distance covered by A, and C has covered double the distance covered by B. Who among the following has covered the least distance?**

a) A

b) B

c) C

d) All three of them have covered equal distance

---

4. **Fill in the blank.**
   Half of 4 + Half of 8 = ___

a) 12 b) 10 c) 8 d) 6

---

5. **If '#' means 'half of 2', '$' means 'double of 2', and '&' means '2', then which of these options results in 3?**

a) 6 – $ – # b) 6 – # – & c) 6 + & + # d) 6 – # + &

---

6. **A circular piece of paper is cut into four identical quarters. Two or more quarters are joined together. Which of these figures can possibly be made by joining them? Note:** *You cannot overlap the quarters*

a) Triangle b) Semicircle c) Trapezium d) Rectangle

---

7. **There are 3 different circular sheets: A, B, and C. The radius of sheet B is twice the radius of sheet A and half the radius of sheet C. Which sheet requires the HIGHEST number of folds to attain the shape of a quarter circle?**

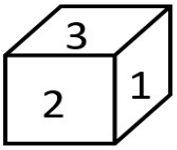
a) A

b) B

c) C

d) All of them require the same number of folds

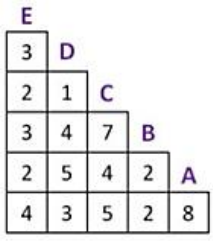
8. If the number on the bottom face of the cube is double the number on the front face, what is the sum of the number on the top face and bottom face?



a) 8 b) 7 c) 6 d) 4

---

9. Three friends are playing a game. In this game, a staircase with numbers written on it is given. The students shown on the right side have to stand on any random step. If a student stands on a step where the numbers in the column below that step add up to either half or double their age, then he/she will win the game. Which of A, B, C, D, or E is the step on which no one will win?



a) Step A b) Both steps B and C
c) Step D d) Step E

---

10. What will come in place of "?"

3_4_6 → 4_8_3

2_2_4 → 3_4_2

2_6_8 → ?

a) 4_12_8 b) 4_12_4 c) 3_3_4 d) 3_12_4

The Thinking Spot

Sam removed a pair of digits from SET A such that the sum of the removed digits equals the sum of the remaining digits in SET A.

Which of the following is NOT a possible two-digit number that can be formed using the remaining digits?

SET A: (1) (2) (3) (4)

(a) 14

(b) 32

(c) 42

(d) Both options b and c

Chapter 9: House of Hundreds – II

1. **In a 3-digit number, the digit in the tens place is twice the digit in hundreds place. What could be the maximum possible sum of the digits?**

   a) 21 b) 12 c) 27 d) 18

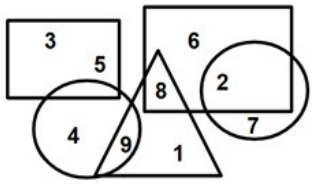
---

2. **Product of two numbers is 100. Which of the given options is DEFINITELY true?**

   a) Sum of these numbers is 25
   b) Sum of these numbers is 20
   c) Sum of these numbers is 52
   d) None of these

---

3. **With regards to the figure given below,**
   X = (The smallest 3-digit number made using different digits from the circles) + (any one digit present ONLY in a rectangle)
   What is the highest possible value of X?



   a) 255 b) 253 c) 252 d) 247

---

4. **Which number will you get if you subtract 1 from the smallest 3-digit number?**

   a) Largest 3-digit number
   b) Smallest 2-digit number
   c) Largest single digit number
   d) Largest 2-digit number

---

5. **If "X" is a number formed by the addition of two 3-digit numbers, then which of the following is DEFINITELY NOT true regarding "X"?**

   a) X can be a 4-digit number
   b) X can be less than 200
   c) X can have all different digits
   d) None of the above

---

6. **If the digits of the options given below are rearranged to form the highest possible number, then which of the following options will give the highest number after the rearrangement?**

   a) 546 b) 273 c) 370 d) 154

7. **There are 500 needles in a box.**
   Between Asha and Nisha, who will pick the last needle?
   Statement 1 - Both players take turns picking up the needles one after another until all the needles are finished.
   Statement 2 - Nisha was the first one to pick a needle.
   To answer the given question, which of the given statements is/are sufficient?

   a) Only 1

   b) Only 2

   c) Both 1 and 2 together

   d) Question cannot be answered even if both statements are used

---

8. **Find the next term in the given series:**
   220, 235, 260, 275, 300, 315, 340, __

   a) 365 b) 375 c) 355 d) 345

---

9. **Raj has forgotten the password to unlock his phone. The password is a 3-digit number. The second digit is 2 times the first digit, and the third digit is 3 times the first digit. How many valid combinations are present to unlock Raj's phone? (Kindly note that 000 is not a valid password combination)**

   a) 1 b) 2 c) 3 d) 5

---

10. **There are 600 students in a school. Some of them play cricket or football, and 240 students play both. The number of students who do not play any sport is 56. How many students play exactly one sport?**

    a) 544 b) 520 c) 340 d) 304

The Thinking Spot

What will come in place of "?"

SQUARE → S Q U A R E

TRIANGLE → T R I A N G L E

RECTANGLE → ?

(a) R E C T A N G L E

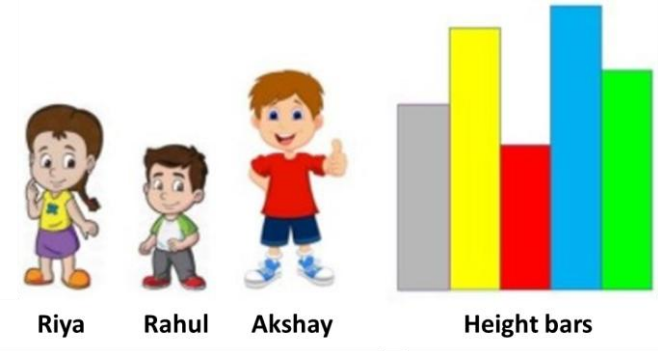
(b) R E C T A N G L E

(c) R E C T A N G L E

(d) R E C T A N G L E

Chapter 10: Fun at Class Party!

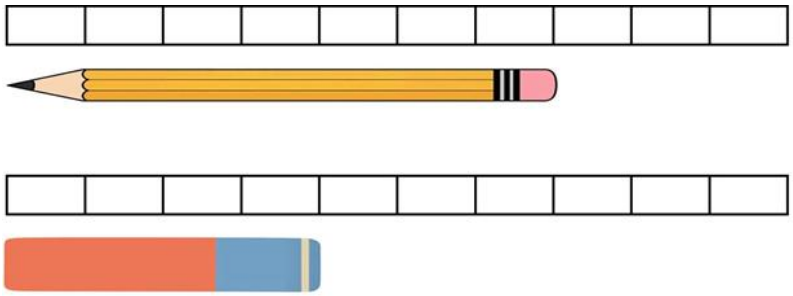
1. **Height bars on the right show the heights of the children on the left. If Rahul is related to red and Akshay is related to green, then Riya is related to which of the following colours?**



a) Blue b) Red c) Yellow d) Grey

---

2. **Find the combined length (in units) of the pencil and the eraser. Note:** *1 box equals 1 unit*



a) 12 units b) 11 units c) 10 units d) 13 units

---

3. **A cricket bat is 11 cm long, a badminton racket is 10 cm long, and a tennis racket is 8 cm long. What is the difference between the length of the longest object and the shortest object?**

a) 1 cm b) 2 cm c) 3 cm d) 4 cm

---

4. **If the girls shown below are arranged in the descending order of their heights, then Misha is neither first nor last. Also, in the original picture Misha is not standing at either of the ends. Who is Misha?**

a) 1 b) 2 c) 3 d) 4

5. **A group of kids with different heights is shown below. How many kids have at least one shorter kid as their immediate neighbour?**

a) 3 b) 4 c) 5 d) 6

---

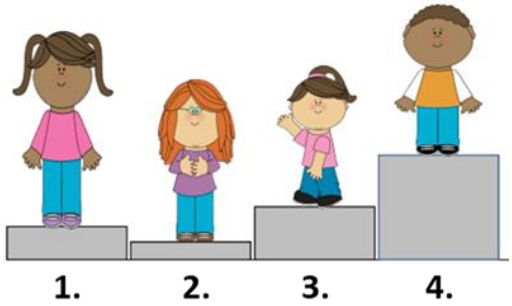
6. **A man starts at point X, jumps forward, and is immediately dragged backward by some distance. The distances of both the forward jump and the backward drag increase by exactly 1 foot in every turn (in a sequential order), as shown in the table below. He starts by jumping 3 feet forward. Find the total number of jumps he makes to touch a pole, 12 feet away from point X.**

Jumps forward	Dragged backwards
3 feet	1 foot
4 feet	2 feet
5 feet	3 feet
6 feet	4 feet
7 feet	5 feet

a) 3 b) 4 c) 5 d) 6

---

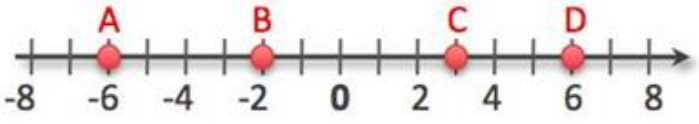
7. **On which Block is the tallest girl (consider the height without the block) standing?**



a) 1 b) 2 c) 3 d) 4

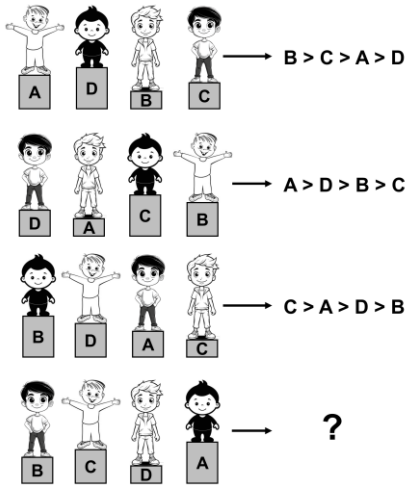
---

8. **In the following image, how many line segments are present, which are EXACTLY a unit greater than any other line segment?**
Note: *Please consider only those segments which are named using the letters*



a) 1 b) 2 c) 3 d) 4

9. What will come in place of "?"



a) **A > C > B > D** b) **D > C > B > A** c) **D > B > C > A** d) **A > B > C > D**

---

10. Among 3 structures, Tower, Pole, and Building, the tower is (3 + 4) cm taller than the building. The building is exactly (5 + 11) cm taller than the pole.
What is the height of the tallest structure?

a) 21 cm b) 16 cm c) Pole + 16 d) Pole + 23

The Thinking Spot

Cut the given strip into exactly 3 different sections by making 2 cuts- one section having 3 blocks, one with 4 blocks, and one with 6 blocks.

What is the MAXIMUM number of glasses that can appear in any section?

(a) 5

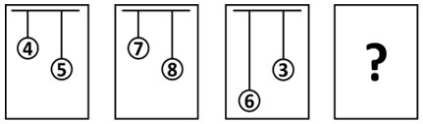
(b) 4

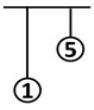
(c) 3

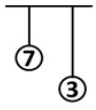
(d) 2

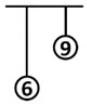
Chapter 11: Filling and Lifting

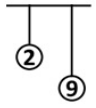
1. If each of the following terms follows the same theme, what will come in place of "?"



a) 

b) 

c) 

d) 

---

2. Find the odd one out.

a) 

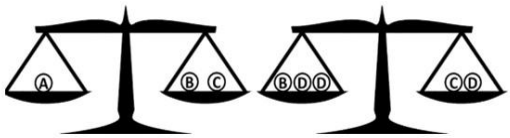
b) 

c) 

d) 

---

3. Given below are two weighing scales balanced using four different types of balls A, B, C, and D. Identify the option which correctly depicts the relationship between weights of balls A, B, and C.



a) A > B > C b) B > C > A c) C > A > B d) A > C > B

---

4. I am a pumpkin weighing 800 grams. A watermelon weighs 450 grams more than me. A musk melon weighs 450 grams less than me. What will be the total weight of musk melon and watermelon?

a) 1 kg and 200 grams
b) 1 kg
c) 1 kg and 600 grams
d) 2 kg

---

5. I am a weighing machine and I can measure weights from 20 kg to 120 kg. Which of the following items will I not be able to weigh?

a) A cylinder of 29 kg
b) A suitcase of 18 kg
c) A boy of 52 kg
d) A box of mangoes of 40 kg

6. **A, B, C, and D are carrying bags of different weights. Each of B, C, and D has a bag lighter than A's bag. Also, C's bag is heavier than B's bag but lighter than D's bag. Who among these 4 has the lightest bag?**

a) A b) B c) C d) D

---

7. **Choose the INCORRECT option.**

a) ○ ○ = △ △

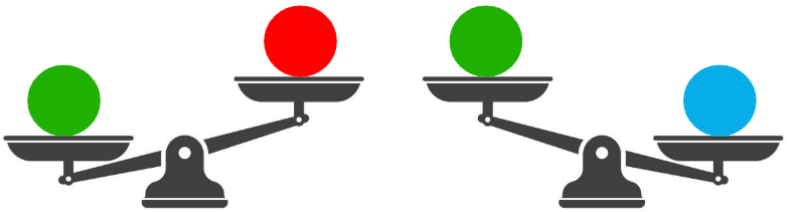
b) ○ ○ > △ △ △

c) ○ = △

d) ○ < △ △

---

8. **There are 3 balls of different weights. Can you find the heaviest ball based on the weighing scales given below?**



a) Red ball b) Blue ball

c) Green ball d) Cannot be determined

---

9. **You have 12 balls. All weigh the same except for one which is a little heavier than the other 11. With the help of a weighing balance, in how many MINIMUM weighings can you certainly find the heavier ball?**

a) 2 b) 3 c) 4 d) 5

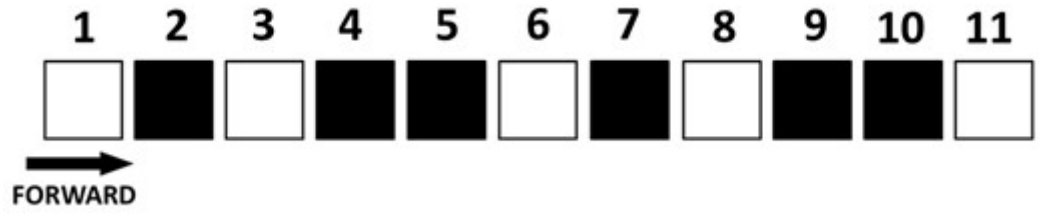
---

10. **A recipe requires 3 litres of milk, and there are 4 litres in 1 packet. How many packets are needed to make the recipe four times?**

a) 12 b) 3 c) 7 d) 1

The Thinking Spot

Sam must travel from block numbered 1 to block numbered 11, moving ONLY in the forward direction. When on a WHITE block, he must skip the next TWO blocks. When on a BLACK block, he must skip the next ONE block. How many black and white blocks will he skip during this journey?



(a) Black - 4, White - 2

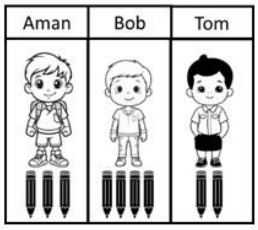
(b) Black - 3, White - 2

(c) Black - 4, White - 1

(d) Black - 3, White - 3

Chapter 12: Give and Take

1. **Aman, Bob, and Tom have some pencils as shown below. After Bob gives one pencil to Aman and 1 to Tom, who will have the MOST number of pencils at the end?**



a) Aman
b) Bob
c) Tom
d) All have an equal number of pencils

---

2. **Sam has Rs. 20. He gives half of the amount to Ram. After that, he buys 2 Pencils. Which of the following options shows the item(s) which he will NOT be able to buy with the remaining money?**

Pencil	Rs. 3
Chocolate	Rs. 2
Eraser	Rs. 1
Ruler	Rs. 4
Sharpener	Rs. 5

a) 2 Chocolates
b) 3 Erasers
c) 1 Sharpener
d) 1 Ruler

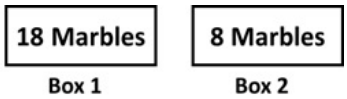
---

3. **Out of the four balloons shown below, Sam shot TWO balloons of DIFFERENT colour. Which of the following CANNOT be the sum of the numbers on the balloons shot?**

a) 5
b) 7
c) 8
d) 9

---

4. **What is the MAXIMUM number of marbles that can be shifted from Box 1 to Box 2, such that Box 1 will still have MORE marbles than Box 2?**



a) 3
b) 4
c) 5
d) 9

---

5. **Which two numbers should be exchanged such that the sum of numbers in Row 1 and Row 2 is equal?**

Row 1	5	6	3
Row 2	7	1	2

a) 5 and 2
b) 3 and 2
c) 6 and 7
d) 3 and 1

6. Four friends A, B, C, and D had 5 chocolates each.

- **A gave 2 chocolates to C**
- **B gave 3 chocolates to A**

Who has the most number of chocolates after the exchange?

a) A b) B c) C d) D

---

7. Aman has 2 blue and 2 red balloons, while Bob has 1 red and 2 blue balloons.

- First, Bob gives 2 balloons of the same colour to Aman

- Then, Aman gives 2 balloons of different colours to Bob

What is the difference in the number of BLUE BALLOONS they have after the exchange?

a) 0 b) 1 c) 2 d) 3

---

8. Three friends Mary, Sam, and Tom have some pairs of shoes as follows:

- Mary has 8 pairs of shoes with her

- Tom and Sam together have 12 pairs of shoes

- Sam and Mary together have 14 pairs of shoes

How many pairs of shoes do Tom and Mary together have?

a) 8 b) 10 c) 12 d) 14

---

9. A has some money which could be in denominations of Rs. 10, Rs. 20, or Rs. 50. If A has three notes whose total is Rs. 90, then which of the following statements is necessarily TRUE?

a) A has only 1 type (denomination) of currency note

b) A has only 2 types (denominations) of currency notes

c) A has all the 3 types (denominations) of currency notes

d) Either option a or option c

---

10. Given below is a question followed by two statements. Identify which of the following statement(s) is/are necessary to answer the question.

Question: How much money do A and B have together?

Statement 1: A has Rs. 30 more than what C has and Rs. 20 less than what B has.

Statement 2: A has Rs. 100.

a) Statement 1 alone is sufficient

b) Statement 2 alone is sufficient

c) Both Statement 1 and Statement 2 are necessarily required

d) Question cannot be answered even if both Statement 1 and Statement 2 are taken

The Thinking Spot

In a parking space there are 4 slots, where each slot can accommodate either a car, 2 scooters, or 3 bicycles. If there are 3 cars, 3 scooters, and 3 bicycles to be parked, then what is the MAXIMUM number of vehicles that can be parked?

(a) 5

(b) 6

(c) 7

(d) 8

Chapter 13: Time Goes On

1. What will come in place of "?"

a) 

b) 

c) 

d) 

---

2. The school is organizing an event in the 5th month of the year. The event will take place twice a month. If the event occurs on even numbered dates only, then which of the following could be possible dates for this event?

a) 6th and 8th June

b) 6th and 13th May

c) 7th and 15th May

d) 6th and 12th May

---

3. The day after tomorrow is Friday. Which day of the week is tomorrow?

a) Wednesday b) Thursday c) Friday d) Saturday

---

4. Cricket matches are held every day from Monday to Friday.

- **Tim watches on Wednesday, as well as the day before and the day after Wednesday**
- **Sam watches on Friday, as well as the day before Friday**

On which day do both Tim and Sam watch a cricket match?

a) Thursday b) Wednesday c) Tuesday d) Friday

---

5. If the day before yesterday was Saturday, which day will be the day after tomorrow?

a) Friday b) Tuesday c) Thursday d) Wednesday

---

6. Anish went on a trip for a few days. He left on a certain day and returned on the same day the next week. How many days did he go out for?

Note: *Please include the day he left and the day he returned in the duration of his trip*

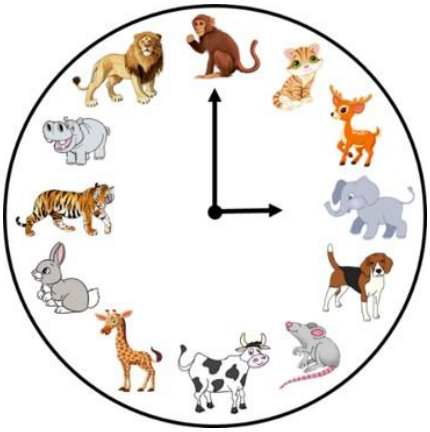
a) 6 b) 7 c) 8 d) 9

---

7. The teacher entered the class at 8:30 AM.
Sam entered the class 2 minutes after the teacher.
Tom entered 5 minutes before the teacher.
George entered 5 minutes after Sam.
Who entered the class last among the following?

a) Tom b) Sam c) George d) George and Tom

8. Which animals will the clock point towards at 7:00 AM?



a) Giraffe and Cat
b) Rabbit and Monkey
c) Mouse and Monkey
d) Giraffe and Monkey

---

9. Mariya has her swimming class tomorrow. If the day before yesterday was Monday, then on which day does Mariya have her swimming class?

a) Monday
b) Tuesday
c) Wednesday
d) Thursday

---

10. In the month of July, no two holidays are on consecutive days. Which of the given options can be understood from the given statement? Note: *Sundays are not necessarily holidays*

a) There cannot be more than 11 holidays in the month of July

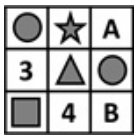
b) There cannot be more than 16 holidays in the month of July

c) There cannot be more than 7 holidays in the month of July

d) None of these

The Thinking Spot

In the grid provided below, each number represents the total number of unique shapes in its row and column combined. What should replace A and B in the grid?



(a) A = 3 and B = 

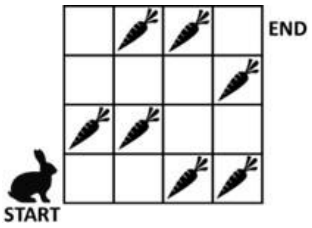
(b) A = 3 and B = 

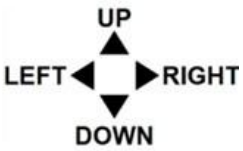
(c) A = 2 and B = 

(d) A = 3 and B = 

Chapter 14: The Surajkund Fair

1. **If the rabbit can move only towards RIGHT or UP, then what is the MAXIMUM number of carrots it can collect from START to END?**





a) 4 b) 5 c) 3 d) 2

---

2. **Which objects will the dog come across on its way if it wants to reach the boy?**

a) 

b) 

c) 

d) 

---

3. **Find the IDENTICAL half of the image given below:**

a) 

b) 

c) 

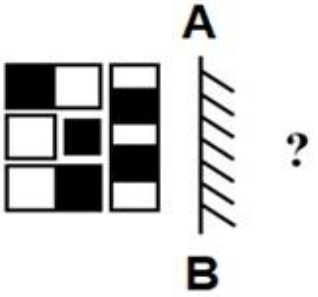
d) 

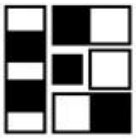
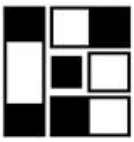
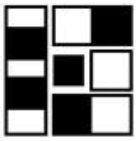
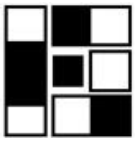
4. **Which of the following pairs of letters will NOT have the same image if they are reflected in a mirror?**
Note: *Assume that the mirror is placed vertically next to the letter*

a) A and H b) O and T c) U and Y d) M and N

---

5. **If a mirror is placed along the line AB, then how will the mirror image of the image given below look like?**



a)  b)  c)  d) 

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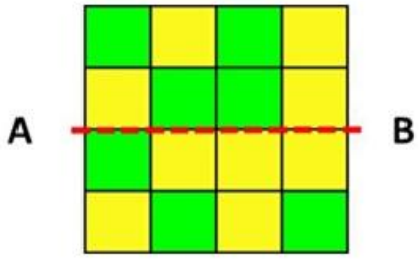
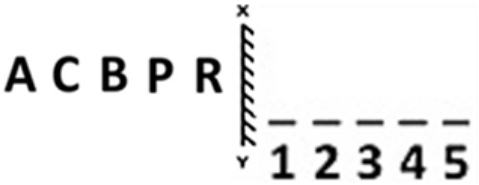
6. **If the given sheet of paper is folded along the line AB, then how many pairs of same-coloured squares will overlap each other? Note:** *Count two overlapped squares as 1 pair*



a) 0 b) 1 c) 2 d) 3

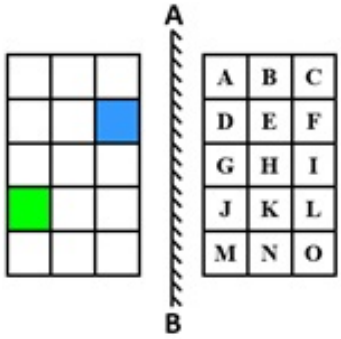
---

7. **If the given image is reflected in a mirror along the line XY, then which letter's reflection will appear in the 4th position?**



a) P b) B c) R d) C

8. **If the image on the right is reflected in a mirror placed along the line AB, then which letters will be reflected on the blue and green coloured blocks in the image on the left?**

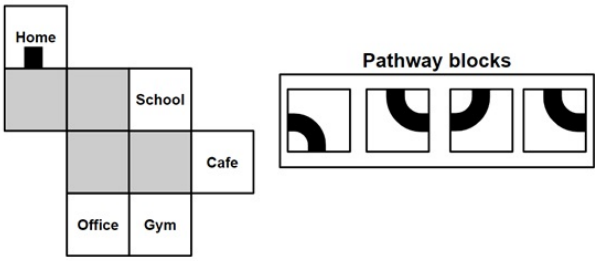


a) F and L b) D and J c) F and J d) D and L

---

9. **Place all the pathway blocks in the image given below to form a connected pathway (indicated by black stripes) starting from Home. Which of the following destinations will the pathway lead to?**

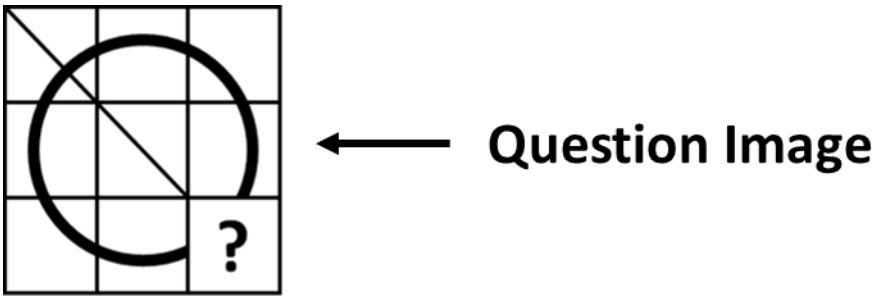
Note: *You are not allowed to rotate the pathway blocks*

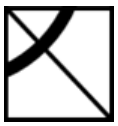


a) School b) Cafe c) Office d) Gym

---

10. **Which of the following options will complete the Question Image given below?**

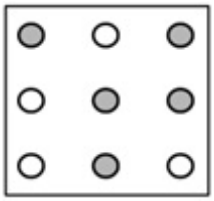


a)  b)  c)  d) 

The Thinking Spot

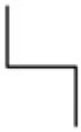
Which of the following patterns from the options CAN be drawn by connecting dots in the given grid such that NO TWO dots of the same colour are directly connected?

Note: *You are not allowed to rotate any of the images*



(a)

(b)



(c)

(d)

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