ICATS
MATHEMATICS
CONTEST 2021

Question Booklet

GRADE 9 & 10
ADOLESCENTS

Time Allowed: 90 Mins.
Maximum Marks: 90

INTERNATIONAL
CATS CONTESTS
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ICATS MATHEMATICS CONTEST 2021
ADOLESCENTS (GRADE 9 & 10)
TIME ALLOWED : 90 MINUTES, MAXIMUM MARKS : 90
TOTAL QUESTIONS : 30 MCQS

INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATORS MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
    A. TODDLERS (GRADE 1 & 2)
    B. KIDS (GRADE 3 & 4)
    C. JUNIORS (GRADE 5 & 6)
    D. JUVENILES (GRADE 7 & 8)
    E. ADOLESCENTS (GRADE 9 & 10 / O-LEVELS)
11. ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT WWW.CATSCONTESTS.ORG
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT INFO@CATSCONTESTS.ORG

Q1. In a certain code GARNISH is written as RGAINHS. How will GENIOUS be written in that code?

A NEGOISU   **B** NGEOISU   **C** NGESUOI   **D** NEGSUOI

Q2. How many such pairs of letters are there in the word MISPLACE each of which has as many letters between its two letters in the word as there are between them in the English alphabet?

A One   **B** Nil   **C** Two   **D** Three

Q3. In a group of cows and chickens, the number of legs was 14 more than twice the number of heads. The number of cows was:

A 5   **B** 7   **C** 10   **D** 14

Q4. A 20% rise is reversed.
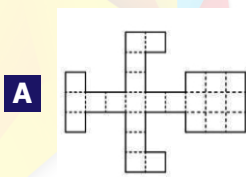What is the percentage fall?

A A 16.66% fall   **B** A 19.61% fall   **C** A 20% fall   **D** A 25% fall

Q5. Identify which of the options given below can be folded to make the 3D object shown in the box.

A

C

B

D
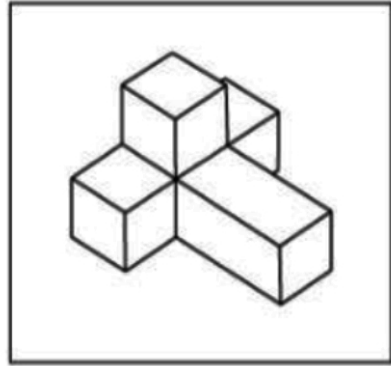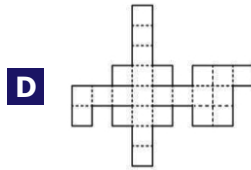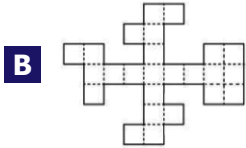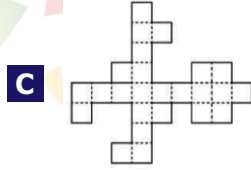
Q6. Shown below are the different views of the same ball. Identify its top view.
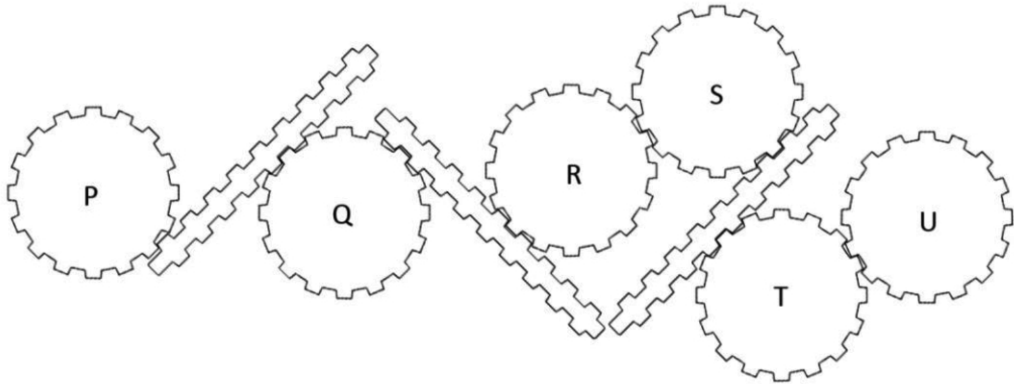
Front Back Left Right

A B C D

Q7. If gear 'P' is the driving gear and rotates clockwise, which of the following statements is true?

A Q will rotate clockwise and S will rotate anticlockwise

B R and T both will rotate anticlockwise

C R will rotate clockwise and U will rotate anticlockwise

D S will rotate anticlockwise and U will rotate clockwise

Q8. The image in the box on the left hand side shows the open and closed positions for a metal stand. The other two images show the various joints in the stand. If a fixed joint is denoted by 'f' and a hinged joint is denoted by 'h' then which of the options is correct?
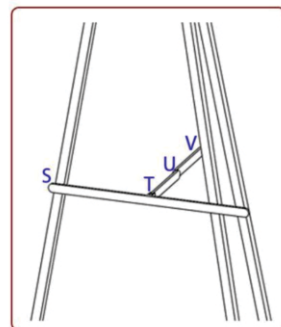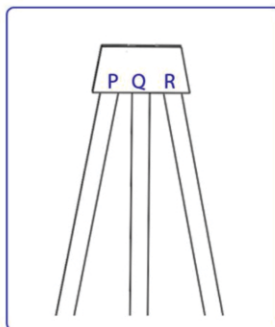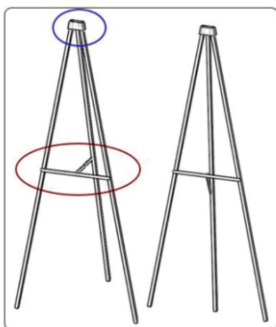
A P-f ; Q-h ; R-f ; S-h ; T-h ; U-f ; V-f

B P-h ; Q-h ; R-h ; S-f ; T-h ; U-f ; V-h

C P-f ; Q-h ; R-f ; S-h ; T-h ; U-h ; V-h

D P-f ; Q-h ; R-f ; S-f ; T-h ; U-h ; V-h

Q9. Choose the figure that should replace the question mark.

?

A   **B**   **C**   **D**
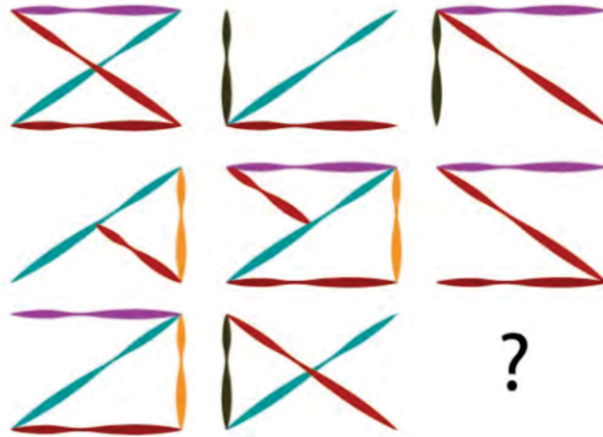
Q10. Choose the pattern that complete the sequence shown below.

```
+  -  /        +  -  \        +  -  /
[  #  )   →    ]  ⋕  (   →    ]  #  (   →   ?
=  %  x        =  o\o x        =  %  x
```

A
```
+  -  /
[  #  (
=  %  x
```

B
```
+  -  \
[  ⋕  )
=  o\o x
```

C
```
+  -  \
[  #  )
=  %  x
```

D
```
+  -  \
]  #  )
=  %  x
```

Q11. Three views of a block with seven different shapes printed on its surfaces are shown below. Find the same block from the options given.

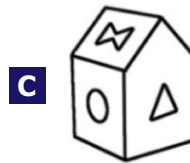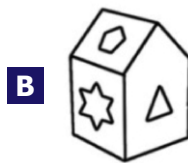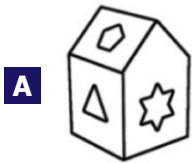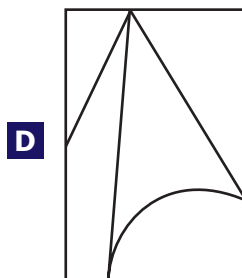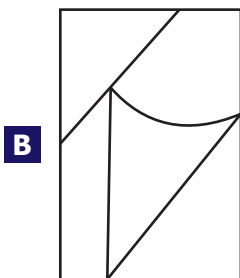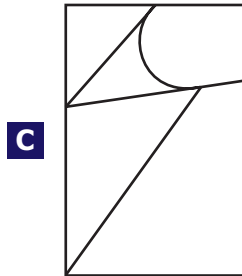View 1   View 2   View 3

A   **B**   **C**   **D**

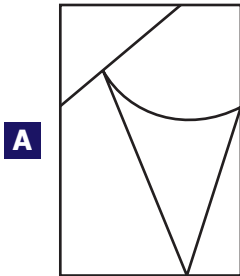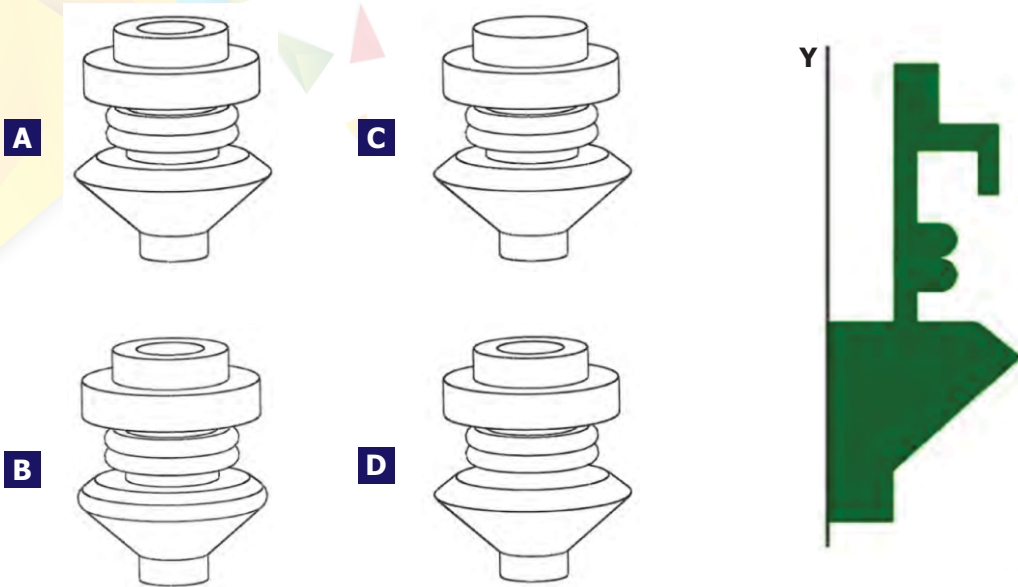**Q12.** On the right hand side are pieces of a jigsaw puzzle. Identify the image that can be reproduced using all the pieces shown at right.

A

**C**

B

D

Q13. If the given flat shape is revolved about the Y axis by 360°, identify the solid shape that will be generated.

A

C

B

D

Q14. Shown below are schematic diagrams of a regular door latch. X represents the door, and Y represents the frame in the wall. Identify which latch can be used for correctly locking the door.

A   Y X

B   Y X

C   Y X

D   Y X

Q15. Pick a point on the outermost ring of the maze shown below, in order to find your way home. Each point indicates the direction of your next move. Which point on the outermost ring should be your starting point in order to reach home in the fewest steps?
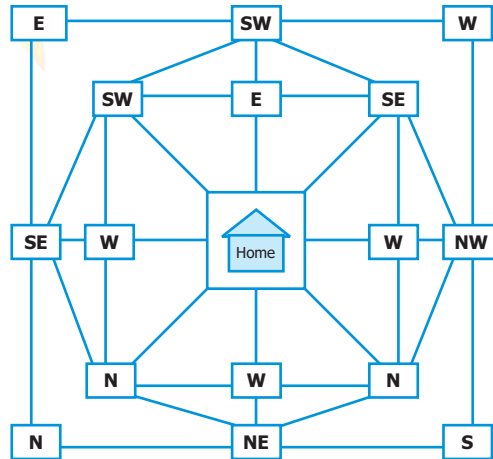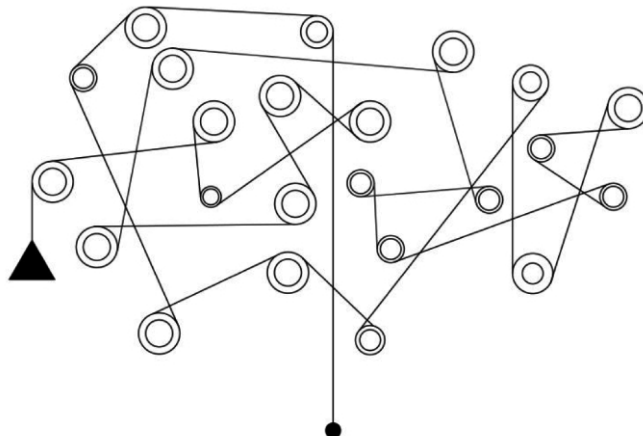

A W **B** N **C** NE **D** NW

Q16. Shown below is a combination of fixed pulleys. If the triangular load moves down, how many pulleys will rotate in the same direction as the smallest pulley (including itself)? The overlapping paths do not interfere with each other.


A 10 **B** 11 **C** 12 **D** 13

Q17. The figure below shows the layout plan of the village A which consists of a cluster of houses. Black lines represent walls and the openings in those walls represent either windows or doors. Also marked are the houses of Riya and Barkya, who are friends. They regularly meet in Barkya's house. If Riya takes the path that has the least number of openings, what is the number of openings that she will have to pass by to get to Barkya's house?
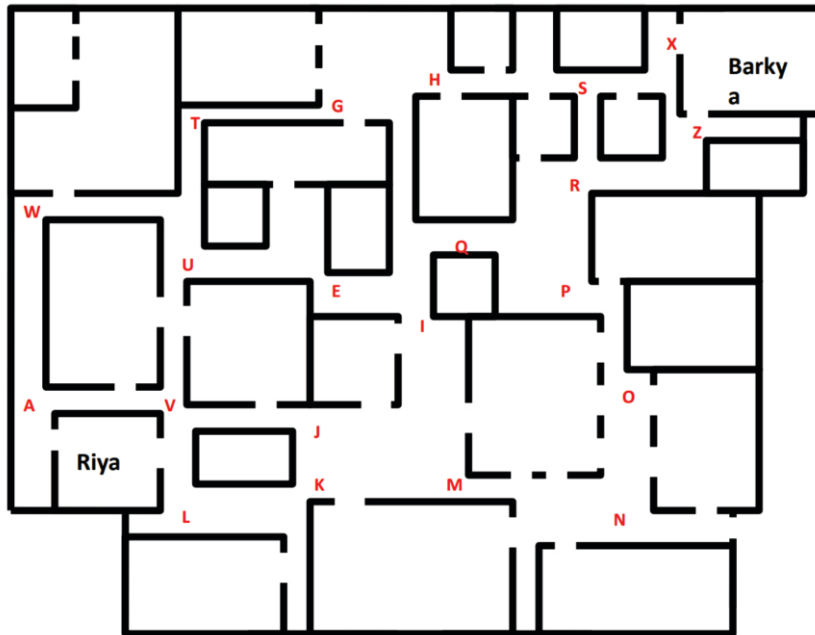

| **A** 3	**B** 4	**C** 5	**D** 6

Q18. The door height of entrance of an Indian Public Hall is to be finalised. Which of the following should be considered to decide the height of the door frame?

A The height of tallest 5 percent of Indian male population.

B The height of tallest 50 percent of Indian female population.

C The average height of tallest 95 percent of Indian male and female population.

D The height of tallest 95 percent of Indian male child population.

Q19. An illustration of a walking ant and a pair of glasses lying on the table surface is shown. Which is the correct illustration from the ant's current point of view?

A **B** **C** **D**
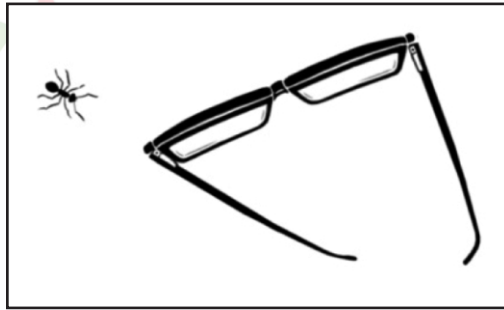
Q20. A solid object made of cubes is shown below. This object is symmetric about all three axes, and does not contain cavities (no hollow spaces). How many cubes does the solid contain?
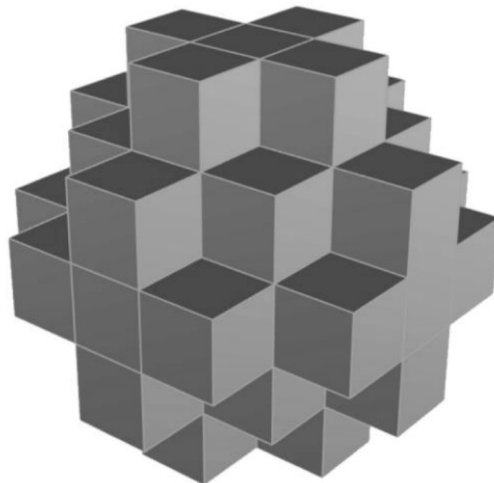

A 55 **B** 57 **C** 59 **D** 61

Q21. The figure given below shows six bar charts corresponding to the volume of agricultural produce from farms of various farmers. The actual quantities are also shown in the figure. Red bars indicate tomatoes, green bars indicate leafy vegetables, and blue bars indicate berries. Assume that they have seen each other's bar charts. Who can correctly make at least one of the following statements?

(i) Everyone who produced any one item more than what I produced, she also produced every other item more.
(ii) Everyone who produced one item less than what I produced, she also produced at least one other item less.
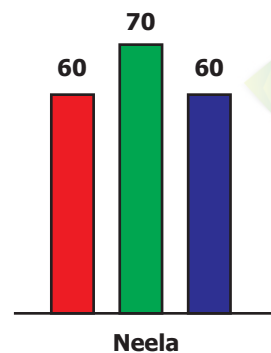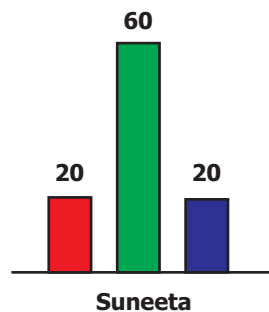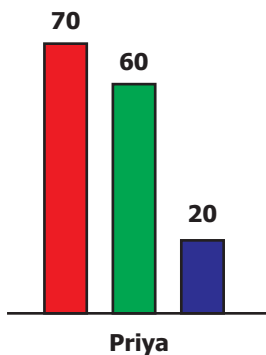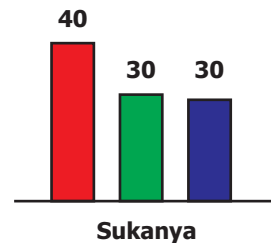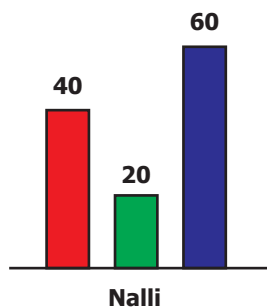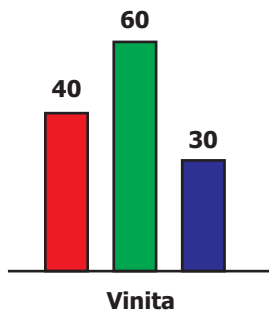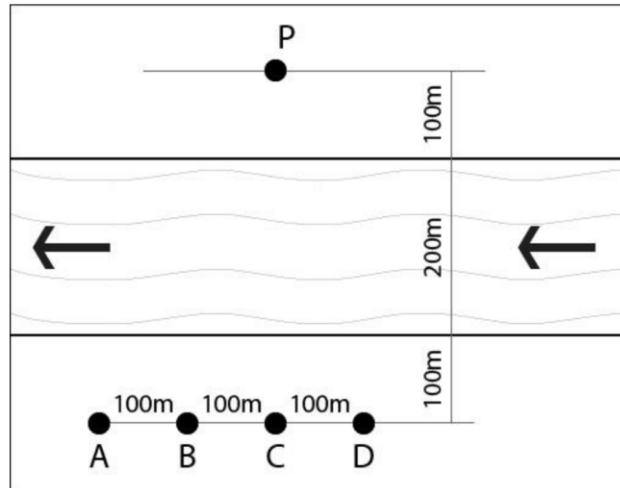

| A | Vinita | B | Priya | C | Neela | D | Suneeta |

Q22. A crocodile at point P sees four meatballs at A, B, C and D across the river. The crocodile moves with the same speed on ground as well as in water. If the speed of river is half the speed of crocodile, which meatball can it catch in the shortest time?
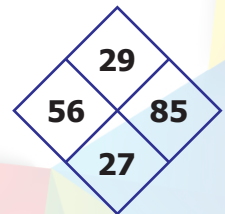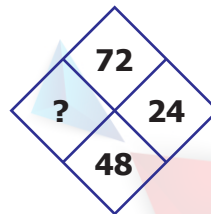

A A

B B

C C

D D

Q23. Which number will replace the question mark?
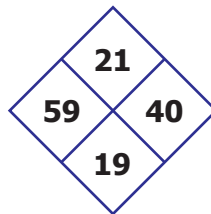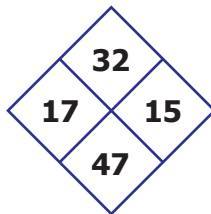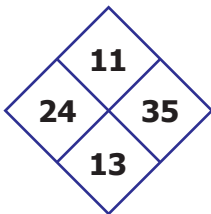
A 21

B 24

C 28

D 30

Q24. The figure below shows a 3 × 3 cube with 4 colours. The same coloured shapes are detached and shown separately for reference. Identify the shape of the red block from the given options.
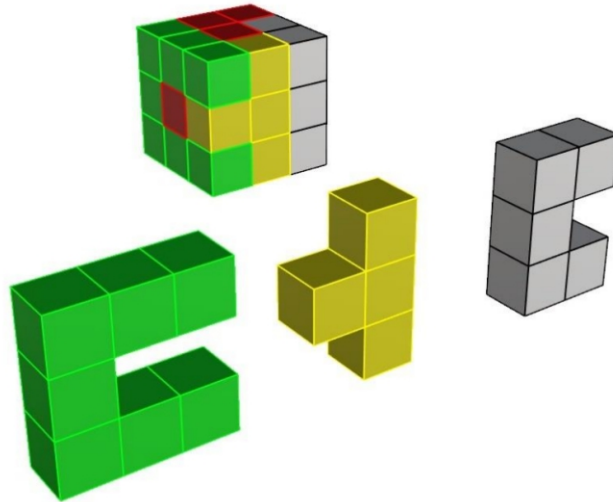
A
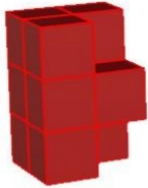
C
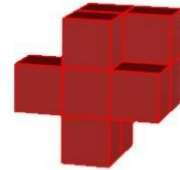
B

D
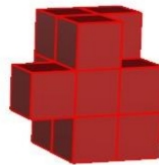
Q25. A solid object was sliced to form two new objects. Each of the two new objects had a circular base. Which shape could not have been the original object?

A cone

B cylinder

C prism

D sphere

Q26. During an experiment, the temperature of a substance increased at a constant rate of three degrees Celsius (°C) per hour. Which graph represents this relationship?

A

SUBSTANCE TEMPERATURE

C

SUBSTANCE TEMPERATURE

B

SUBSTANCE TEMPERATURE

D

SUBSTANCE TEMPERATURE
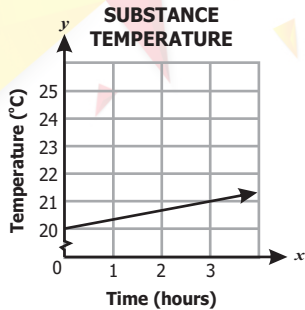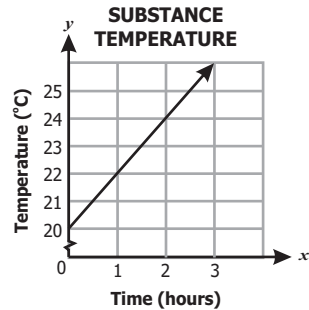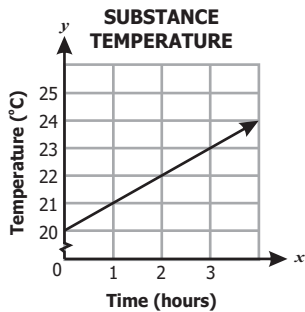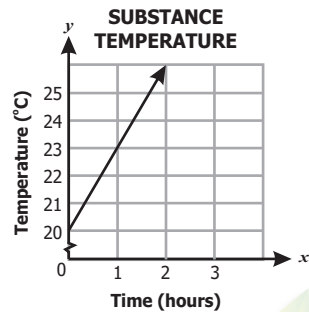
Q27. Which set of angle measures could be the interior angles of a triangle?

A 90°, 90°, 90°

B 80°, 80°, 200°

C 40°, 50°, 60°

D 15°, 30°, 135°

Q28. Two photographers offer different pricing plans for their services. The graph below models the prices Photographer A charges. The table below shows the prices Photographer B charges. Each photographer charges a one-time equipment fee and an hourly rate.
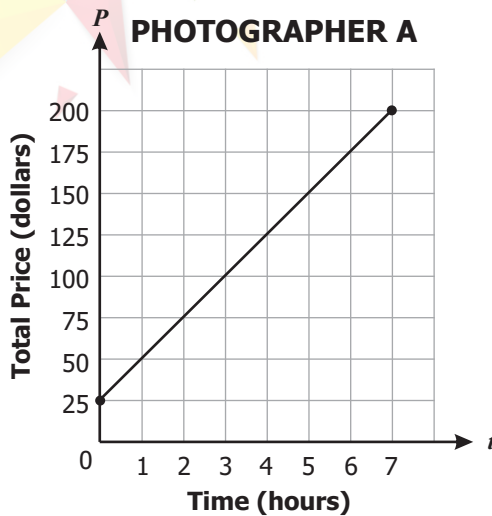
PHOTOGRAPHER A

PHOTOGRAPHER B

Time (hours)	2	4
Total Price	$80	$110

Which statement about the two pricing plans is true?

A Photographer A charges $15 per hour more than Photographer B.

B Photographer B charges $15 per hour more than Photographer A.

C Photographer A's equipment fee is $25 less than Photographer B's.

D Photographer B's equipment fee is $25 less than Photographer A's.

Q29. At a local basketball game, all tickets are the same price and all souvenirs are the same price. Mr. Smith bought 2 tickets to this basketball game and 1 souvenir for a total of $17.25. Ms. Lockhart bought 5 tickets to the same game and 2 souvenirs for a total of $42.00. How much was a ticket to this game?

A $2.25   **B** $7.50   **C** $8.50   **D** $9.75

Q30. A newspaper conducted a survey to find out how many high school students play video games. The two-way table below displays the data from the survey.

VIDEO GAME SURVEY

	Boys	Girls	Total
Do Play Video Games	1,593	1,361	2,954
Do Not Play Video Games	858	1,635	2,493
Total	2,451	2,996	5,447

Based on these data in the table, which statement is true?

A There were 2,451 boys surveyed, and about 29% of them play video games.

B There were 2,996 girls surveyed, and about 45% of them play video games.

C There were 5,447 students surveyed, and about 54% of them do not play video games.

D There were 2,493 students surveyed, and about 34% of them are girls who do not play video games.

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National Toppers ICATS ART Contest 2020

Student Name	Father Name	Grade	School
MUNTAHA ABASSI	MUNEER AHMED	1	PAKTURK MAARIF INTERNATIONAL SCHOOL
EMAAN FATIMA NAQVI	SYED ARIF HUSSAIN	2	ARMY PUBLIC SCHOOL AND COLLEGE
MUHAMMAD UMAIR	YOUNAS MUHAMMAD MUGHAL	3	BEACONHOUSE SCHOOL SYSTEM
AHMED KHAN	M. BILAL KHAN	4	KARACHI CAMBRIDGE SCHOOL
FABIHA RASHID	M. RASHID	5	LAHORE GRAMMAR SCHOOL
AYESHA ARSHAD	RANA M. ARSHAD	6	PAKISTAN INTERNATIONAL PUBLIC SCHOOL
AREEBA AHMAD	MATEEN AHMED	7	KIPS SCHOOL
MANAHIL AHMED	KHAWAJA MUSHTAQ AHMED	8	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 14)
SHIFA NOORANI	SIRAJ NOORANI	9	LEADERSHIP SCHOOL
ESHA SALMAN	MUHAMMAD SALMAN BUTT	10	THE EDUCATORS

Congratulations

National Toppers ICATS Creative Writing Contest 2020

Student Name	Father Name	Grade	School
ALIYA HASNAIN	HASNAIN NAQVI	1	LAHORE GRAMMAR SCHOOL
AHMED KAMAL	MAJ. MUHAMMAD KAMAL	2	ARMY PUBLIC SCHOOL
BURHANUDDIN	M. HUSAIN KOTHARI	2	MSB EDUCATIONAL INSTITUTE
AMNA AZEEM	MUHAMMAD FAISAL	3	THE LEARNING CASTLE SCHOOL
ZARA KHALID	KHALID HAKIM	4	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 14)
HARIS A	ANWAR	5	PESHAWAR MODEL SCHOOL
KHADIJA HASNAIN	HASNAIN QADRI	6	LAHORE GRAMMAR SCHOOL
MERAL AZMAT	AZMAT KHAN	7	BEACONHOUSE SCHOOL SYSTEM
AMINA NOOR	MUHAMMAD JAHANGIR	8	FAUJI FOUNDATION MODEL SCHOOL
INSHAL	ISRAR KHAN	9	KOHINOOR GRAMMAR SCHOOL
AREESHA IMTIAZ	IMTIAZ ALI	10	HABIB GIRLS' SCHOOL

Congratulations

Compete
if you are the best

www.catscontests.org