**CRITIRCAL AND CREATIVE THINKING ITEMS**

**CLASS IX : CHAPTER 3 : COORDINATE GEOMETRY**

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**Theme 1**

**BOOKING MOVIE SHOW**

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Mandeep family has planned for a movie show for the week end. They booked the tickets for four members of the family, the seats in the cinema hall are as follows.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 |
| B10 | B9 | B8 | B7 | B6 | B5 | B4 | B3 | B2 | B1 |
| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 |
| D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 |
| E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | E10 |
| F10 | F9 | F8 | F7 | F6 | F5 | F4 | F3 | F2 | F1 |
| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 |
| H10 | H9 | H8 | H7 | H6 | H5 | H4 | H3 | H2 | H1 |
| I1 | I2 | I3 | I4 | I5 | I6 | I7 | I8 | I9 | I10 |
| J10 | J9 | J8 | J7 | J6 | J5 | J4 | J3 | J2 | J1 |

Due to weekend they are not able to get all the four seats together. They were offered seats C1,C2 and with this they were offered either D1,D2 or B1,B2 or D9,D10 .

Q1. Which is the most suitable seats with seats C1,C2

(a) D1,D2 (b) B1,B2 (c) C9,C10 (d) D10,D9

Q2.If Simran, Mandeep’s sister is sitting on seaton C1, find the row and column for her from top-

(a)Row3,Column1 (b) Row1,Column1 (c)Row3,Column3 (d)Row1,Column3

Q3.Mandeep is sitting on seat C2, during intermission Sukdev, Mandeep’s friend came to him and tells him that he is on seat three rows behind him and in the same column what is Sukhdev’s seat number?

(a)D6 (b)G2 (c)C5 (d)A2

Q4. If the exit Gates are near A1 and J10,who will reach the exit gate first, Mandeep or Sukhdev.

**Theme2**

**HIGH RISE BUILDINGS**

Rekha’s mother is planning to book a flat in Gaur City having 10 towers. Towers 1,3 and 5 are having 18 floors, Towers 2,4 and 6 are having 19 floors and remaining towers are having 20 floors.

As Rekha’s grandmother is having problem in knees so they prefer to book the flat in lower floors but Rekha advices that when the builder is providing lift, then why can’t we book flats in higher floor.In this tussle they compromised for 5th floor.

(i) Builder offer 5th floor only in towers having maximum floors.

(ii) Below 5th floor in tower with 18 floors.

(iii) And above 5th floor in remaining towers.

Q1.Can you think of some reasons for people shifting in highrises.

Q2. Out of the following combinations,which combinations is not suitable for Rekha’s family

(a)Tower10, 5th floor(b)Tower8, 5th floor(c)Tower7, 5th floor(d)Tower5, 5th floor

Q3.If the towers are given alphabetical orders i.e, Tower1 as A Tower, Tower2 as B Tower and so on…and address of the flats are given like A5 for first tower 5th floor D7 for fourth tower and 7th floor which of the following is possible address for Rekha’s flat.

(a) B5 (b) E5 (c)K5 (d) H5

Q4.If there is only one flat on one floor, can you find the total number of flats in Gaur City. If yes how many flats are there?

**Theme 3**

**'Pariksha Pe Charcha-2020'** to be held on Jan 20

Students, teachers and parents across India are eagerly awaiting Prime Minister Narendra Modi’s interaction programme 'Pariksha Pe Charcha-2020'.

The event will be held at Talkatora Stadium in New Delhi on coming Monday. Over two thousand students, parents and teachers will be participating from all over the country.

The government of India has decided to conduct PM’s Interaction Programme with school students. Students of classes VI to XII must view the event named 'Pariksha Pe Charcha-2020.

To have proper view for each and every student KVAGCR has planned the following seating plans, if the strength in classes VIth to VIIIth is 50 students per class, Class IXth has 60 students, Class Xth has 40 students and class XI and XII has 25 students in each class.

Junior Wing VI to VIII Senior Wing IX to XII

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| VIII |  |  |  |  |  |  |  |  | 50 |  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 31 |  |  |  |  |  |  |  |  |  |  | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 21 |  |  |  |  |  |  |  |  |  |  | XI |  |  |  | XI 25 | XII 1 | XII 2 | XII 3 | XII 4 | XII  5 |
| 11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 2 | 3 |  |  |  |  |  |  |  |  | XI1 | XI | XI | XI4 | XI5 | XI6 | XI7 | XI8 | XI9 | XI10 |
| VII |  |  |  |  |  |  |  |  | 50 |  | X |  |  |  |  |  |  |  |  |  |
| 31 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| VI |  |  |  |  |  |  |  |  | 50 |  |  |  |  |  |  |  |  |  |  |  |
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| 11 |  |  |  |  |  |  |  |  | 20 |  | 11 |  |  |  |  |  |  |  |  | 20 |
| 1 | 2 | 3 |  |  |  |  |  |  | 10 |  | 1 | 2 | 3 |  |  |  |  |  |  | 10 |

Q1.What is the effect of interaction with PM for the students who are actually in stress during exam days?

Q2.What are the benefits of the programme and how it improves the result?

Q3.Find the class and the roll number of the students sitting in senior wing has a seat which is mirror image of seat of student of class 8 roll number 12(all the students are sitting according to their roll numbers).

(a)(XI,9) (b) (XI,2) (c) (XI,19) (d) None of the these.

Q4.If a Student of class IX roll number 15 is absent can you imagine the mirror image of the seat in Junior Wing?

(a)(IX,15) (b) (VI,16) (c) (VI,15) (d) (IX,16)

**Theme 4**

**MATHEMATICS IN ART**



Mrs.Sylvia Das, an Art teacher , observes that these days, students are taking too much interest in Mathematics,and are least interested in Art Education ,so she innovates a method to use mathematics in art.

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|  |  |  |  |  |  |  |  |  |  |  | 2 | I |  | H | E |  |  |  | D |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  | o | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |  |
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Q1 Art teacher is trying to interlink her subject with other subject .Why she is trying to do this?

(a) to make her subject interesting

(b) she is planning to change her subject

(c) mathematics is very important subject.

(d)her favourite subject is mathematics

Q2. What are the coordinates of point B and point D.

Q3.What shape you will get by joining the points L(5,2) , M(7,2), N(7,3), P(5,3) in order.

Q4. What is the name youcan give to the shape obtained in part 3, also identify the shape formed by points ABC.

**Theme 5**

**EXAMINATION ROOM**

To Have fair results in a competitive examination, 60 candidates of four different fields are made to sit in the examination hall.

The fields are – Science Olympiad, Maths Olympiad, English Olympiad and Cyber Olympiad

Roll number of science and Maths Olympiad Students are from 1 to 15, and roll number of English and Cyber olympiad is from 16 to30 .The hall in which these students sit is having 5 columns and 6 rows. Sitting plan is to be done from top left as follows--

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Eng Math | Sci Cyber | Eng Math | Sci Cyber | Eng Math |
| Sci Cyber | Eng Math | Sci Cyber | Eng Math | Sci Cyber |
| Eng Math | Sci Cyber | Eng Math | Sci Cyber | Eng Math |
| Sci Cyber | Eng Math | Sci Cyber | Eng Math | Sci Cyber |
| Eng Math | Sci Cyber | Eng Math | Sci Cyber | Eng Math |
| Sci Cyber | Eng Math | Sci Cyber | Eng Math | Sci Cyber |

Q1. What is the use of conducting such competitions when the students are having their regular class examinations. Select the option which is not suitable.

(a)For the collection of money, as they charge a huge amount for registration.

(b)For the search of talent

(c) For encouraging students to take interest in those topics also which are not in their academic syllabus.

(d)To inculcate creative and critical thinking among students.

Q2. Students of which subjects are sitting 3rd row and 2nd column?

Q3. Maths student roll number 8 is sitting in which row and column and with whom?

Q4. Why Olympiads are held for subjects likeMaths,Science English and Cyber etc. and not for Hindi, Sanskrit, Environmental Studies e.t.c., for school students

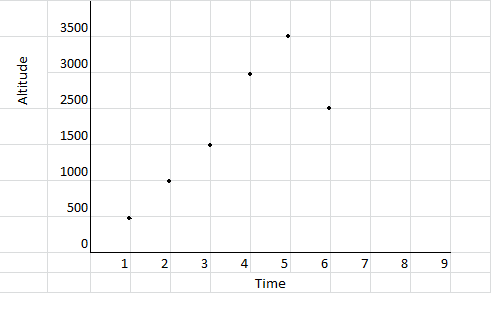
**Theme 1**

**AIR TRAFFIC CONTROL**

All the air traffic is controlled by air traffic controller. A Controller must know the location of every aircraft at any particular instant of time in the sky. Coordinates of any particular vehicle are used to describe its current location of the aircraft. Even if an aircraft moves a small distance (up, down, forward or backward), Its coordinates are updated in the system



If x axis represents the time (in hours) and y axis represents the altitude (in Km) then answer the questions (if 1 on x axis represent 6:00 am and 1 unit is 15 mins)



Q1.What is the altitude at 6:45 am.

1. 500 km (b)1000 km (c) 3000 km (d) 3500 km

Q2. What are the coordinates at 7:15 am?

1. ( 25,6) (b) (6,2500) (c) (4,3000) (d) (3500,5)

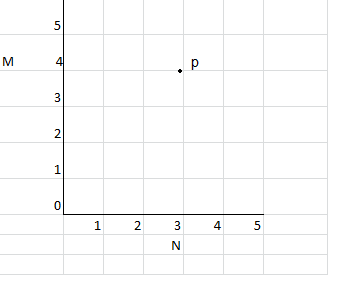
Q3.At what time, the altitude is 1500 Km.

(a)6:00 a.m. (b) 6:30 a.m. (c) 7:00a.m. (d) 6:45 a.m.

**Theme – 2**

**DIAMOND ROBBERY**

A precious diamond is placed in an exhibition. There is tight security all around it. Two thieves Babloo and Shyam are trying to steal it .They are unaware about the presence of each other. Babloo is hiding at point N(3,0) and Shyam is hiding at point M(0,4) and the diamond is placed at point P. Both of them are also unaware about the policeman on duty at point O. Based on their locations, give answers.



Q1. Which of the following is true?

1. N is nearer to diamond.
2. M is nearer to diamond.
3. No one is nearer to diamond.
4. Both are at same distance from box.

Q2. What are the coordinates of the diamond.

1. (2,3) (b) (3,4) (c) (4,3) (d) None of these

Q3. What will be the shortest distance travelled by policeman to the diamond?

1. 7 (b) 12 (c) 5 (d) None of these

Q4. If it takes 1 min by policeman to cover one unit , 1.5 min by Babloo to cover one unit and 1.25 min by shyam to cover 1 unit,who will take least time to reach the diamond if started simultaneously.

1. Policeman
2. Babloo
3. Shyam
4. All together

**Theme – 3**

**PAINTINGS**

Annu is putting up one of her paintings in her living room. Suppose there were a grid on the wall where each unit measures a foot. The painting is represented by the inner square and frame is represented by outer square.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | P |  |  |  |  | Q |  |  |  |  |
| 10 |  |  | A |  |  | B |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |
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| 6 |  |  | D |  |  | C |  |  |  |  |  |
| 5 |  | S |  |  |  |  | R |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |
| 1 |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |

Q1. Maya places a nail so that it lies halfway across the top of the frame. Write the coordinate of point…………………………………………

Q2. Write the abscissa of upper left corner of painting.

1. 9 (b) 5 (c) 3 (d) 6

Q3. What is the width of frame outside painting.

1. 1 (b) 2 (c) 10 (d) 6

Q4. What is the ordinate lower right corner of frame?

1. 2 (b) 3 (c) 6 (d) 5

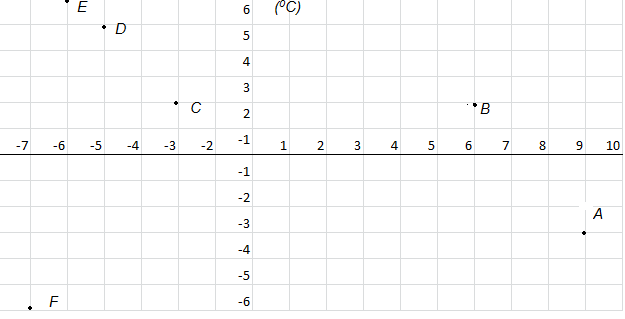
Q5. What is the length of each side of painting?

……………………………………………………………………

Theme – **4**

**TEMPERATURE**

Ram graphed the relationship between temperature and elevation (height above the sea level)for several cities. The x-coordinate is the elevation in meters and y-coordinate is the temperature in degree Celsius.



(m)

Q1.Which quadrant would contain a point showing a city 6m above sea level and 90C below zero.

1. I (b) II (c) III (d) IV

Q2. What was the temperature in city with an elevation of -6m?

1. -70 C (b) 20 C (c) 60 C (d) -20 C

Q3. What was the elevation when temperature was - 30 C ?

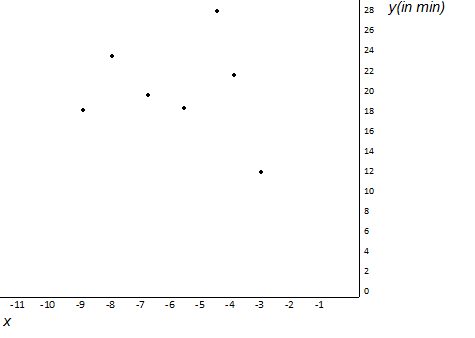
1. 2m (b) -2m (c) 9m (d) -9m

Q4.What is the effect of average increase in temperature on the earth?

…………………………………………………………………………………………………

**Theme – 5**

**TRAFFIC PROBLEM**

Ravi’s office was 15 Km from his home. Ravi tracks his commute time. The coordinate plane below shows some of his commute time in the last two works. The x-axis of graph represents the numbers of days before today. -1 represents yesterday. The y –axis represents the commute time in minutes.

Q1. 2 days ago Ravi’s commute time was halfway between his commute time 8 and 9 days ago. At what coordinate Ravi should graph his commute time 2 days ago.

(a) (-2,22) (b)(20,-2) (c)(-2,21) (d) (-2,20)

Q2.How much time he took 4 days ago\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q 3 .By looking at the data what is the range of his commute time for 3 days ago and 7 days ago.

1. 12 (b) 8 (c) 22 (d) 17

Q4. What is effect of increased commute time on road for the commuting crowd?

……………………………………………………………………………………………………………….

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**Theme - 1**

**PROJECT TIGER**

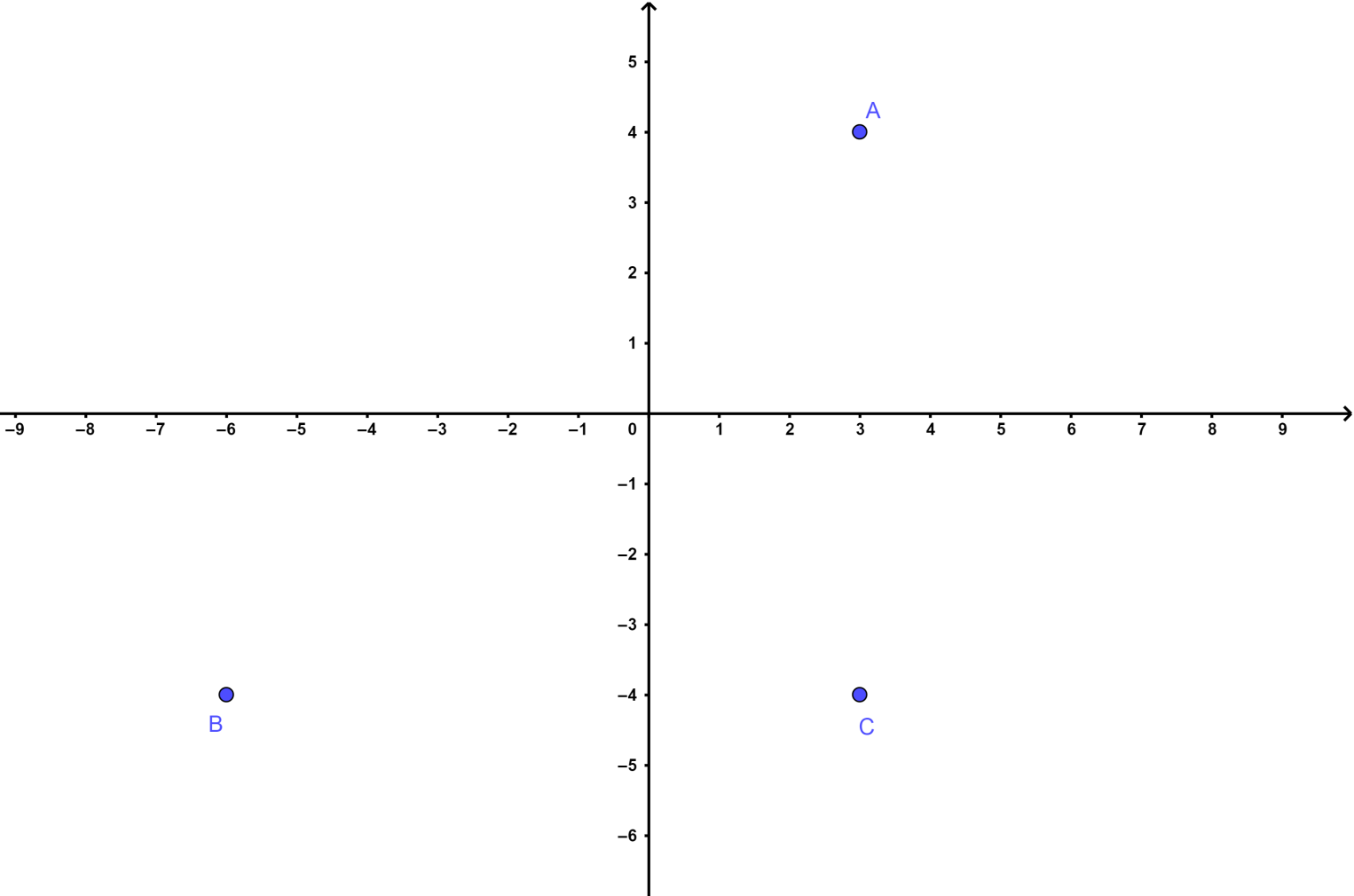
One of the most successful wildlife conservation ventures 'Project Tiger' which was initiated way back in 1972, has not only contributed to the conservation of tigers but also of the entire ecosystem. This project is sponsored by Ministry of Environment Forest and Climate Change. About 47 tiger reserves situated in more than 17 regions including Corbett National Park and Ranthambore National Park are part of this project which conducts assessments of number of tigers, their habitat, hunting habits under the supervision of the Tiger Task Force. Project Tiger has seen significant success in recovery of the habitat and increase in the population of the tigers in the reserve areas, from a scanty 268 in 9 reserves in 1972 to above 1000 in 28 reserves in 2006 to 2000+ tigers in 2016.

Ranthambore National Parkintroduced protection for tigers from hunters in 1973 and is now one of the best tiger reserves in India. One of the most interesting features of the park is that it's dotted with ancient ruins, including a fort where tigers and leopards are often spotted. Apart from tigers, the park is home to leopards, jungle cats, sloth bears, hyenas, Indian foxes, jackals and crocodiles. The greatest chances of spotting a tiger are in April and May.

The foot print of the tiger is important. It is considered that each pug mark is unique in itself & by analyzing various foot prints in the areas of tigers, the number of tigers in that area can be counted. GPS collar is used track few tigers.



A trip to Ranthambore National Park was organized by Kendriya Vidyalaya NFC VIgyan Vihar. The area of the park is divided into four quadrants of the coordinate plane.

****

**Question 1:**

From control room i.e. point A, of the co-ordinate plane, a tiger is located at point B. What are the coordinates of Tiger?

1. (4, 3)
2. (-6,-4)
3. (-4, 3)
4. (3, -4)

**Question 2:**

The location of the tiger is reported as the midpoint of the line segment joining Control room A and Students location C. What is the location of tiger now?

1. (0, 3)
2. (0, 0)
3. (3, 0)
4. 1, 3)

**Question 3:**

Another student group is at point E(-2,0).Which student group (Point) is nearer to the recent most position of the tiger?

**Question 4:**

Tiger, now, has moved 3 points towards East and 2 points towards North? What is the new location of Tiger?

1. (6, 2)
2. (6, -2)
3. (0, 2)
4. (0, -2)

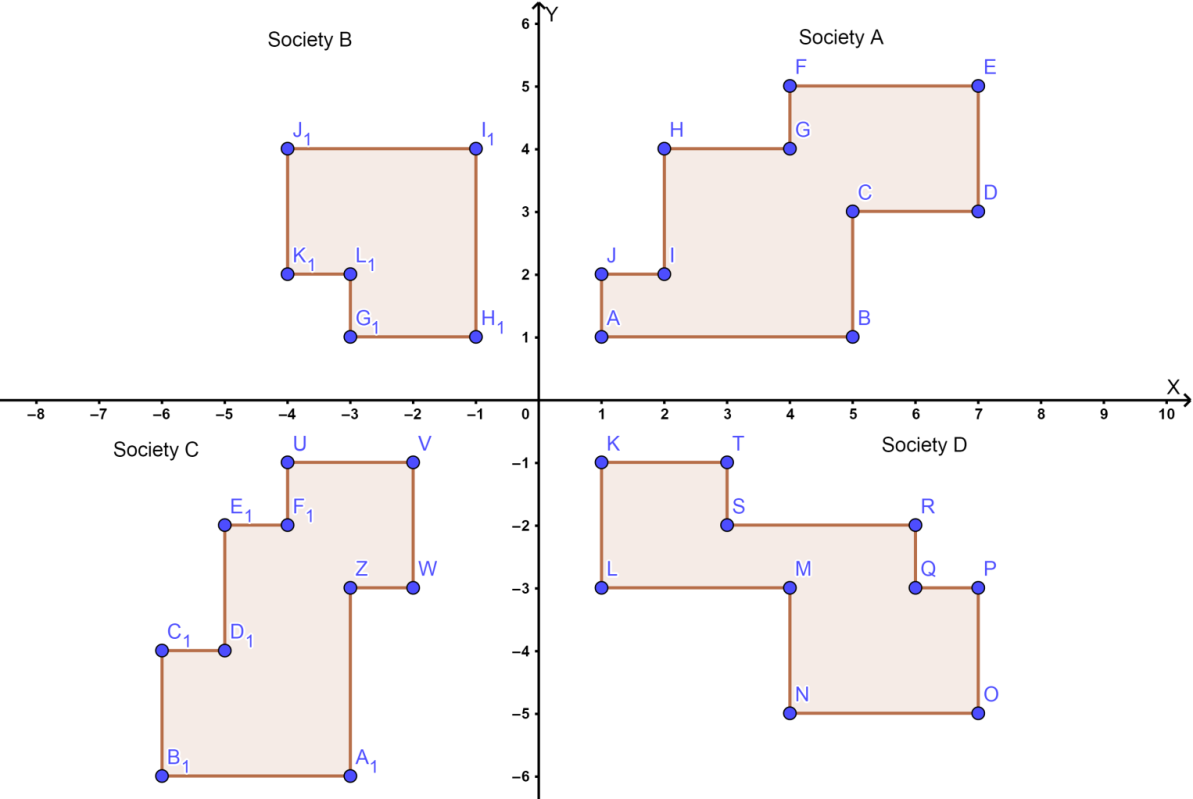
**Theme - 2**

**PLOG RUN**

Plastic pollution is now considered a major threat to the earth’s environment. Plastic waste and microplastics are a serious danger to the ocean habitats, the natural world and even our own health. Most of the plastic comes originally from the land. To control this, the Swedish phenomenon of “plogging” where joggers combine their run with picking up the trash they find in nature is going global.

To mark the 150th birth anniversary celebration of Mahatma Gandhi, Kendriya Vidyalaya Sangathan organized “FIT INDIA PLOG RUN” on 2nd October 2019 in all its schools across India. More than 45000 teachers, 500000 students and 125000 parents participated in the plog run.

Students of Class-IX of Kendriya Vidyalaya NFC Vigyan Vihar were allotted four housing society. Two cross roads perpendicular each other divides these four housing societies. They have to plog run along the roads of the society. Four groups naming Group 1, Group 2, Group 3, Group 4 of 2 students each, were formed. The map of roads of four housing societies is shown as coordinate plane.

Road Map of Four Housing Societies for Plog Running

1unit = 150m

Group 1, Group 2, Group 3 and Group 4 were allotted Society D, Society C, Society B, Society A respectively.

**Question 1:**

Both the students of group 4decided to start from point B and will meet each other at point F. One student took the path BCDEF and otherstudent took BAJIHGF route.

The coordinates of B and F are –

1. B(5,1) F(5,4)
2. B(5,1) F(4,5)
3. B(1,5) F(4,5)
4. B(1,5) F(5,4)

**Question 2:**

Find the distance covered by the student who took the path BCDEF?

**Question 3:**

Both the students of group 2 decided to start from point V and will meet each other at point B1. One student took the path VWZA1B1 and other student took VUF1E1D1C1B1 route.

At point D1, the student gotinjured while plog run and some vehicle was arrangedto pick him up. What are the coordinates where the student got injured?

**Question 4:**

What is the total distance (in km) covered by all the groups?

**Theme - 3**

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| **PAINTING**   |  | | --- | | Seema is a painter. She has exhibited many paintings. She is putting up one of her painting in her living room. Suppose there is a grid on the wall where each unit measures an inch. The painting in the frame is represented by the inner square and the frame is represented by the outer square. Seema places a nail so that it lies half way across the top of the frame. |   Painting.png  B  A  D  C  **GRID.png**  **Question 1:**  If upper left corner of frame is at (1,8) and upper right corner of frame at (7,8). What will be the coordinate of the nail placed by Seema.  **Question 2:**  Seema’s friend Meera said that the bottom left corner of your frame is at (1,2). What will be the coordinate of bottom right corner?  **Question 3:**  Seema wants her painting to be safe and free from dust. So she covered it while going for vacations. What will be the area of paper used while covering the painting?  **Question 4:**  If a mirror is placed along with the side BC of frame, what will be the coordinates of B and C as seen  in the reflection? |  |

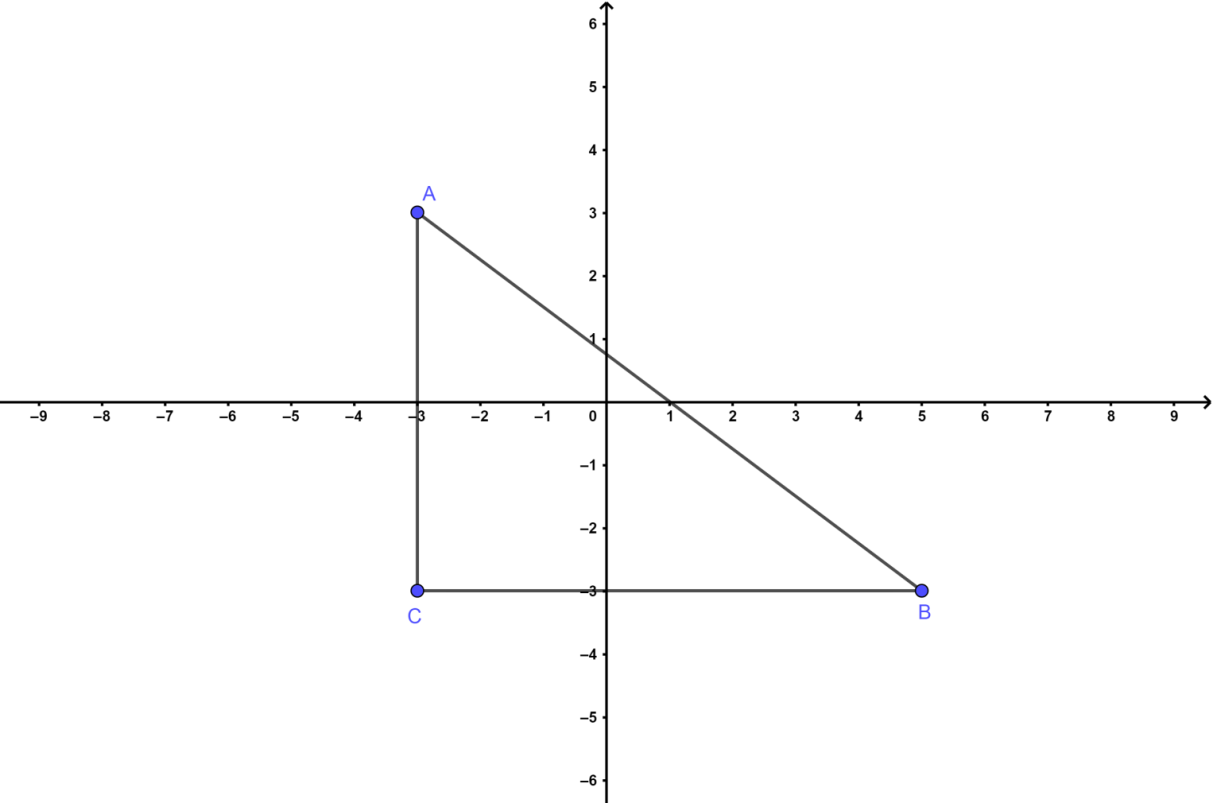
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| **Theme 4**  **FARMER**   |  | | --- | | A farmer Naresh has the field AGDCFE as shown in the map. He decided to grow three crops in his field. Naresh divided his field into three fields for each crop. There is shortage of onions in the country and he decided to grow onions on the field which has more area. In the field having smallest area he decided to grow wheat and in remaining field he decided to grow tomatoes. |   Map showing field owned by a Naresh FARMERfarmer.png  1unit = 25m  **Question 1:**  What are the coordinates of field in which onion is grown?  **Question 2:**  Naresh needs to water the fields of onion and tomatoes with a sprinkler. He decides to place sprinkler in the middle of each field. Write the coordinates where Naresh will put sprinkler in the field of tomato.  **Question 3:**  Annual yield of wheat in India in FY 2018 is 3,371 kilograms per hectare.  What is expected yield of wheat in Naresh field?  **Question 4:**  The revised purchase price of wheat is 1,840 rupees ($25.09) per 100 kg for 2019 compared with 1,735 rupees a year ago, Farm Minister Radha Mohan Singh said. India, the world's second-biggest rice and wheat producer, buys the grain from local farmers at state-set prices to build stocks to run a major food welfare programme.  How much earning is expected by Naresh? |  |

**Theme 5**

**PIZZA DELIVERY**

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| Pizza Hut, a subsidiary of Yum! Brands, serves and delivers more pizzas than any other pizza company in the world. Founded in 1958, Pizza Hut has become the most-recognized pizza restaurant in the world, operating more than 16,900 restaurants in more than 105 countries. In June 1996, Pizza Hut made its foray into India with a restaurant in Bangalore. The restaurant brand offers menu consisting of its signature pizzas, appetizers, pastas, desserts and beverages. Pizza Hut was recently felicitated with the title of India’s 70 Most Trusted Power Brands.  One of the Pizza Hut outlets is located at Point A in a city. The grid plan of the city is given below. The outlet requires 13min to prepare a pizza. To compete with other Pizza Companies Pizza Hut promises to deliver Pizza in 30 min. Average speed of delivery boy to deliver pizza is 45 km/hr. |

Map showing route options for PIZZA DELIVERY



1unit = 500m

**Question 1:**

Pizza Hut outlet received the order from location C at 1:30pm. Give the location of Point C in coordinates.

**Question 2:**

Find the distance to be covered by delivery boy from A to C?

**Question 3:**

Pizza Hut outlet received another order from location B at 1:34pm. Delivery Boy has to deliver both the orders. By what time Delivery boy will reach at location B if it takes 3 min to deliver a pizza at a location.

**Question 4:**

Find the total distance travelled by delivery boy to reach back its outlet after delivering pizzas at location B and C?

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