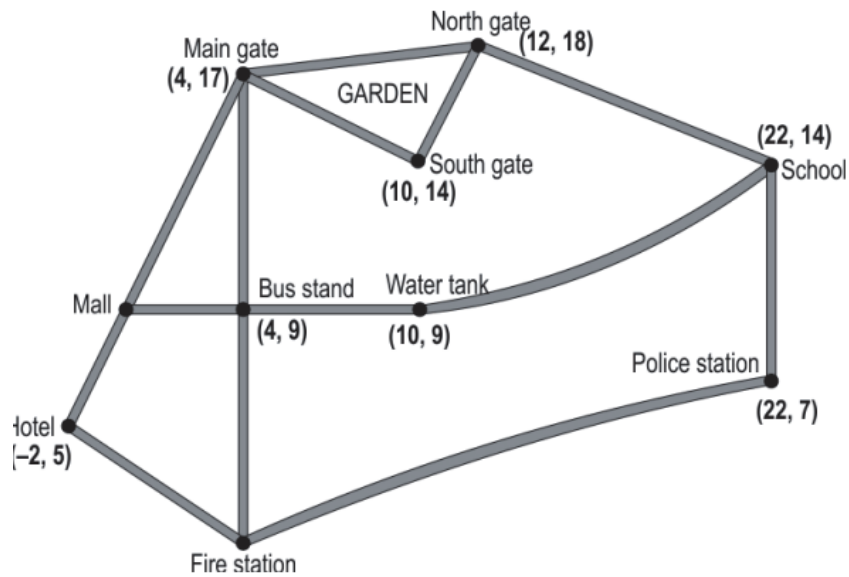| | |
|---|---|
| Department of Mathematics | **INDIAN SCHOOL AL WADI AL KABIR**<br>**Department: Mathematics**<br>**Class X**   **Coordinate Geometry**<br>**07 - 09 - 2023** |

### Case Study – Based Questions

**I**  Shown below is a map of Giri's neighbourhood.

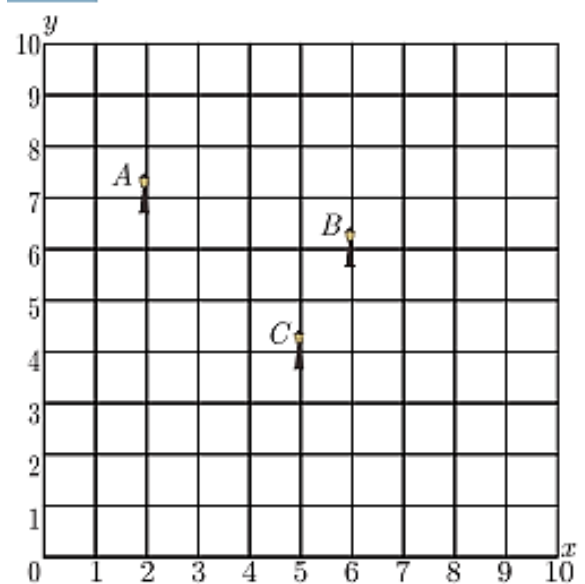Giri did a survey of his neighbourhood and collected the following information:

- ➢ The hotel, mall and the main gate of the garden lie in a straight line.
- ➢ The distance between the hotel and the mall is half the distance between the mall and the main gate of the garden.
- ➢ The bus stand is exactly midway between the main gate of the garden and the fire station.
- ➢ The mall, bus stand and the water tank lie in a straight line.

Based on the above information, answer the following questions:

| 1. | What is the x-coordinate of the mall's location? | 1m |
|---|---|---|
| 2. | What are the coordinates of the fire station? | 1m |
| 3. | What is the shortest distance between the water tank and the school? | 2m |
| 4. | How much more is the shortest distance of the school from the water tank than the distance of the school from the police station? | 2m |

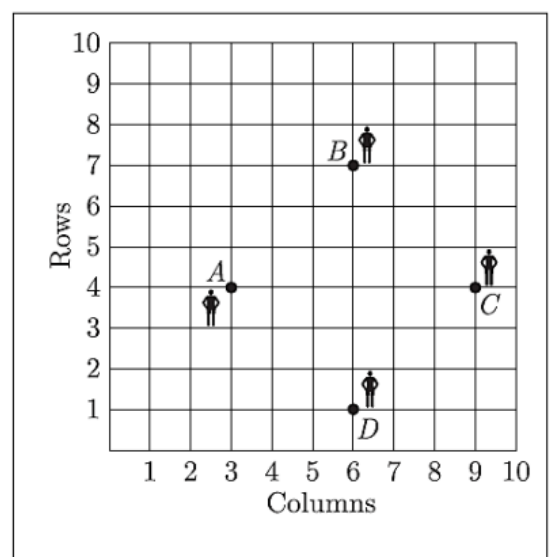| II | Resident Welfare Association (RWA) of a Gulmohar Society in Delhi have installed three electric poles A, B and C in a society's common park. Despite these three poles, some parts of the park are still in dark. So, RWA decides to have one more electric pole D in the park. |
|---|---|

The park can be modelled as a coordinate system given below.



Based on the above information, answer the following questions:

| 5. | What is the position of the pole C? | 1m |
|---|---|---|
| 6. | What is the distance of the pole B from the corner O of the park? | 1m |
| 7. | Find the position of the fourth pole D so that four points A, B C and D form a parallelogram. | 2m |
| 8. | What is the distance between poles A and C? | 2m |

**III**

In a classroom, 4 friends of class 10 are seated at the points A, B, C and D as shown in Figure.

Two of their classmates Arnav and Raghav observes the positions of these four friends for few minutes. They made a chart for the positions of A, B, C and D which is given below.
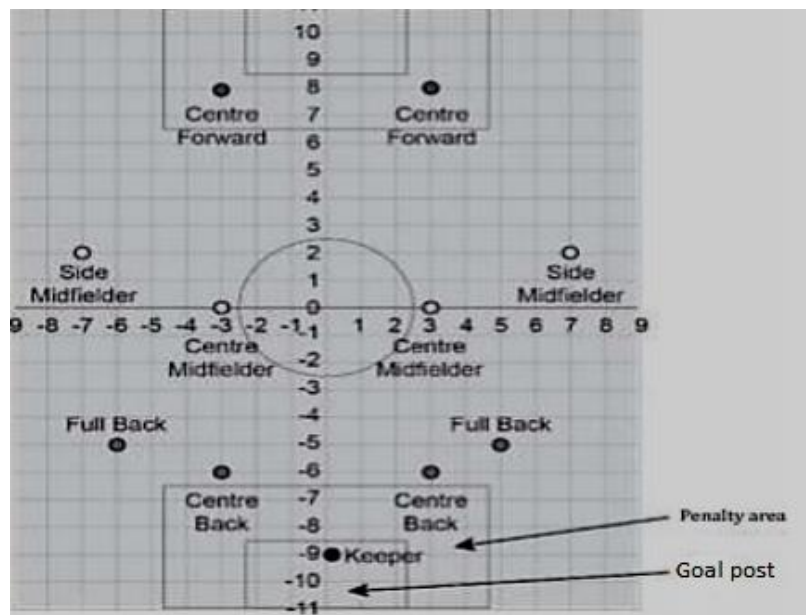


Worksheet/Class X/Case study/Coordinate Geometry/Mary Sunitha/2023-24

| 9. | What are the coordinates of D? | 1m |
|---|---|---|
| 10. | What are the coordinates of the midpoint of AC? | 1m |
| 11. | Find the distance between B and C? | 2m |
| 12. | What is the figure formed by joining A, B, C and D in order? | 2m |

| IV | In a cinema hall, people are seated at a distance of 1m from each other, to maintain the social distance due to CORONA pandemic. Three people sit at points P, Q and R whose coordinates are (6, -2) (9,4) and (10,6) respectively. |
|---|---|



| 13. | What is the distance between P and R? | 1m |
|---|---|---|
| 14. | Find the midpoint of the line segment joining P and R? | 1m |
| 15. | Find the ratio in which Q divides the line segment joining P and R. | 2m |
| 16. | If a point S, lying on the straight-line joining Q and R such that it divides the distance between them in the ratio of 1:2, then find the coordinates of S. | 2m |

| V | Ronit is the captain of his school football team. He has decided to use a 4-4-2-1 formation in the next match. The figure below shows the positions of the players in a 4-4-2-1 formation on a coordinate grid. One square box represents 1 square unit. |
|---|---|

| | | | |
|---|---|---|---|
| 17. | Write the coordinates representing the position of the goal keeper. | 1m |
| 18. | What is the distance between the two Centre Forward positions in Ronit's plan? | 1m |
| 19. | Find the distance between the points representing Centre forward in the second quadrant and Full back in the fourth quadrant. | 2m |
| 20. | Find the coordinates of the midpoint of the line segment joining the Centre Forward and Side Midfielder in the first quadrant? | 2m |

## ANSWERS

| Q.1 | 0 | Q.2 | (4, 1) | Q.3 | 13 units | Q.4 | 6 units | Q.5 | (5, 4) |
|---|---|---|---|---|---|---|---|---|---|
| Q.6 | $6\sqrt{2}$ units | Q.7 | (1, 5) | Q.8 | $3\sqrt{2}$ units | Q.9 | (6, 1) | Q.10 | (6, 4) |
| Q.11 | $3\sqrt{2}$ units | Q.12 | square | Q.13 | $4\sqrt{5}$ units | Q.14 | (8, 2) | Q.15 | 3: 1 |
| Q.16 | $(\frac{28}{3}, \frac{14}{3})$ | Q.17 | (0, -9) | Q.18 | 6 units | Q.19 | $\sqrt{233}$ units | Q.20 | (5, 5) |