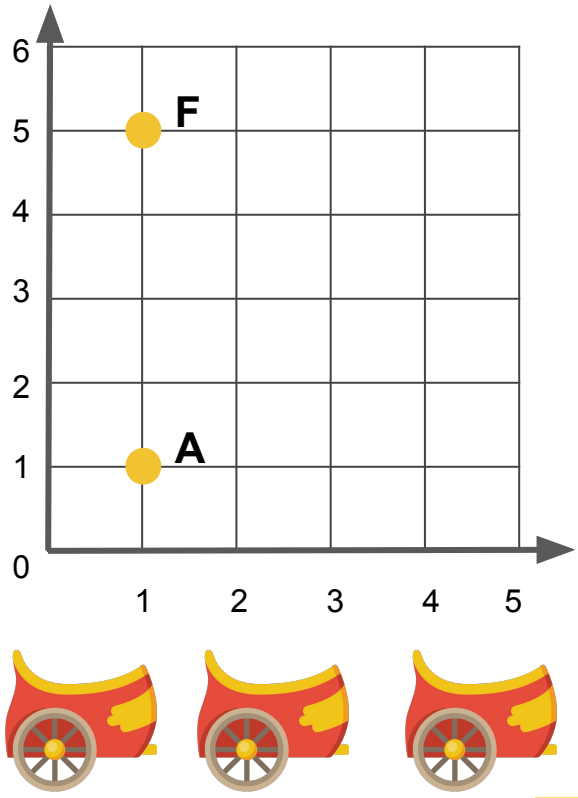
Helping With Math

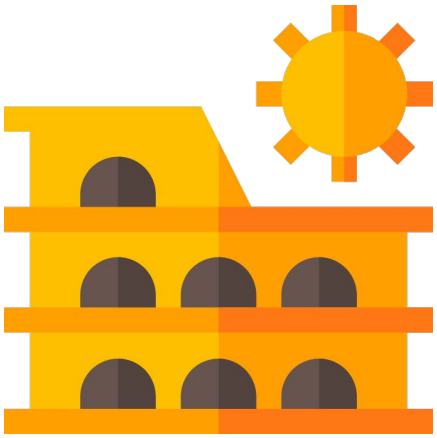
Solving Word Problems Involving Coordinate Plane

GRADE 5

Cartesian Coordinate Plane is useful in daily lives. Scientists, navigators, and geologists are maximizing the learned concepts to solve real-life problems.



The next destination of a group of historic travelers are plotted on the coordinate plane. If 1 unit = 1 km, how long is the distance from point A to point F?



COORDINATE PLANE IN LIFE

- In real life, coordinates are used to describe the location of anything in relation to zero or point of origin.
- Some make use of **polar coordinates** to avoid collisions between vessels and other ships or natural obstructions.

ILLUSTRATIVE EXAMPLES

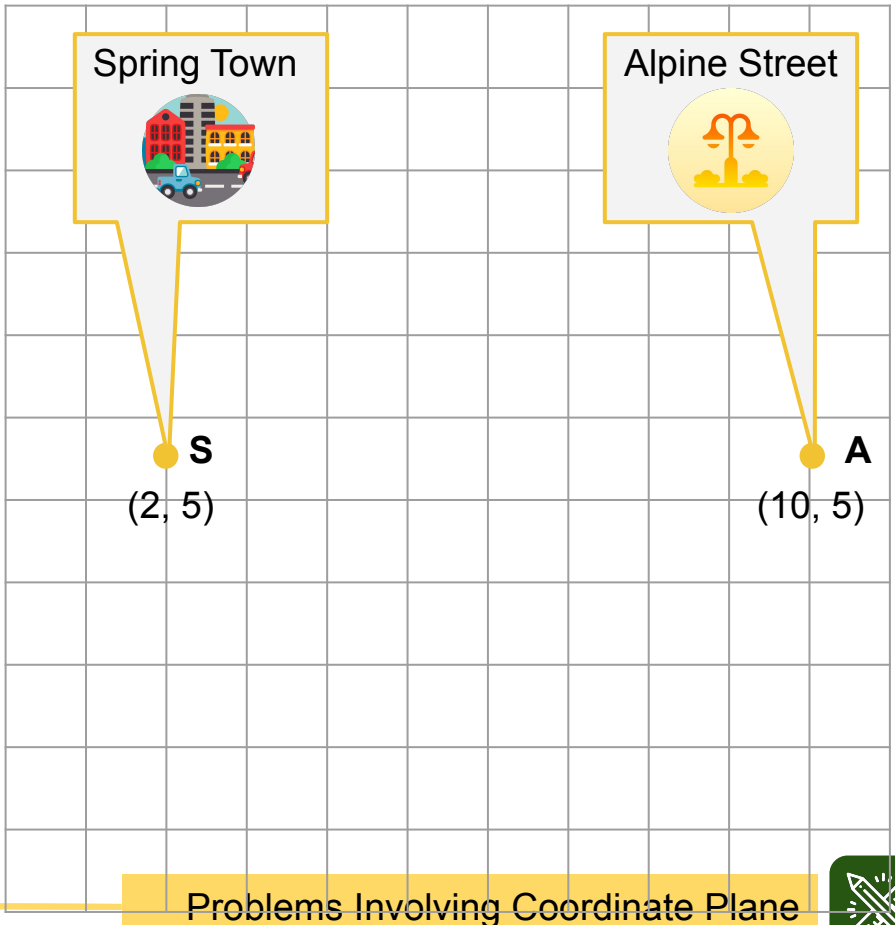
An antique store wants to locate their new shop halfway between Spring Town and Alpine Street. Spring Town is located at (2, 5) on the grid map while Alpine Street is at (10, 5). Where should the new antique shop be located?

SOLUTION:

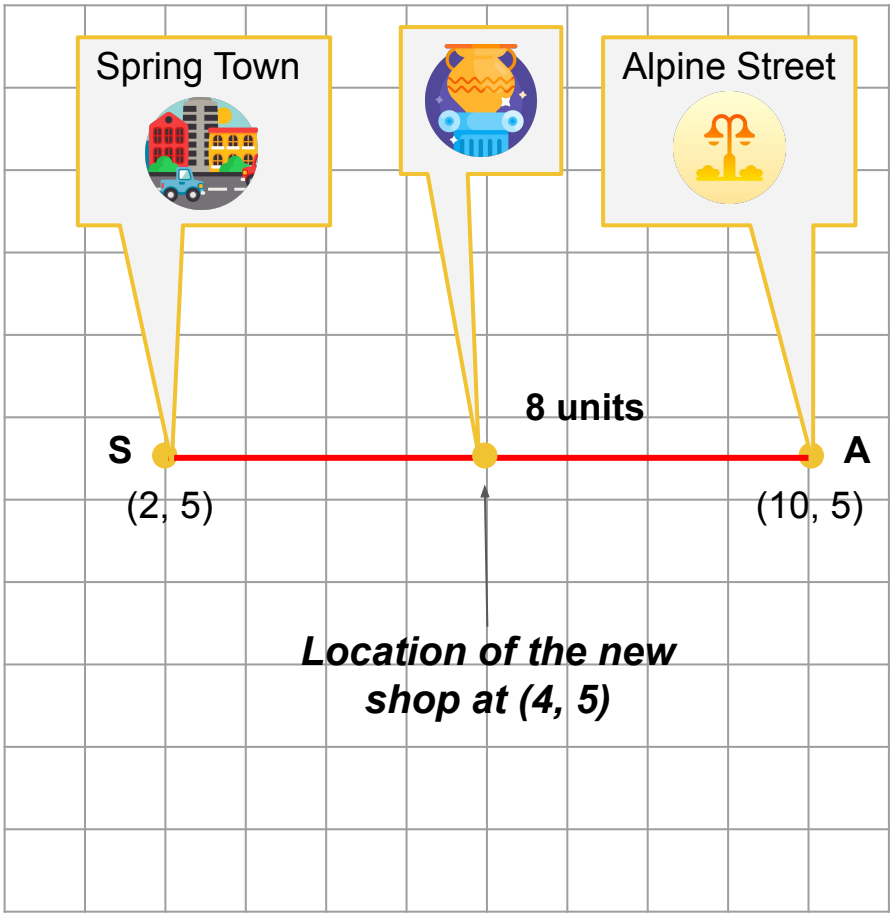
1. Plot the given points on the coordinate plane. Let point S be the location of Spring Town and point A be the location of Alpine Street.

Point S (2, 5)

Point A (10, 5)



COORDINATE PLANE IN LIFE



2. Count how many units these two points are apart.

Point S (2, 5)

Point A (10, 5)

Get the difference of the x-coordinates.

d = 10 - 2 = 8

The distance is 8 units.

Since the antique store wants to locate their new shop halfway between Spring Town and Alpine Street, we need to get the half of the computed distance.

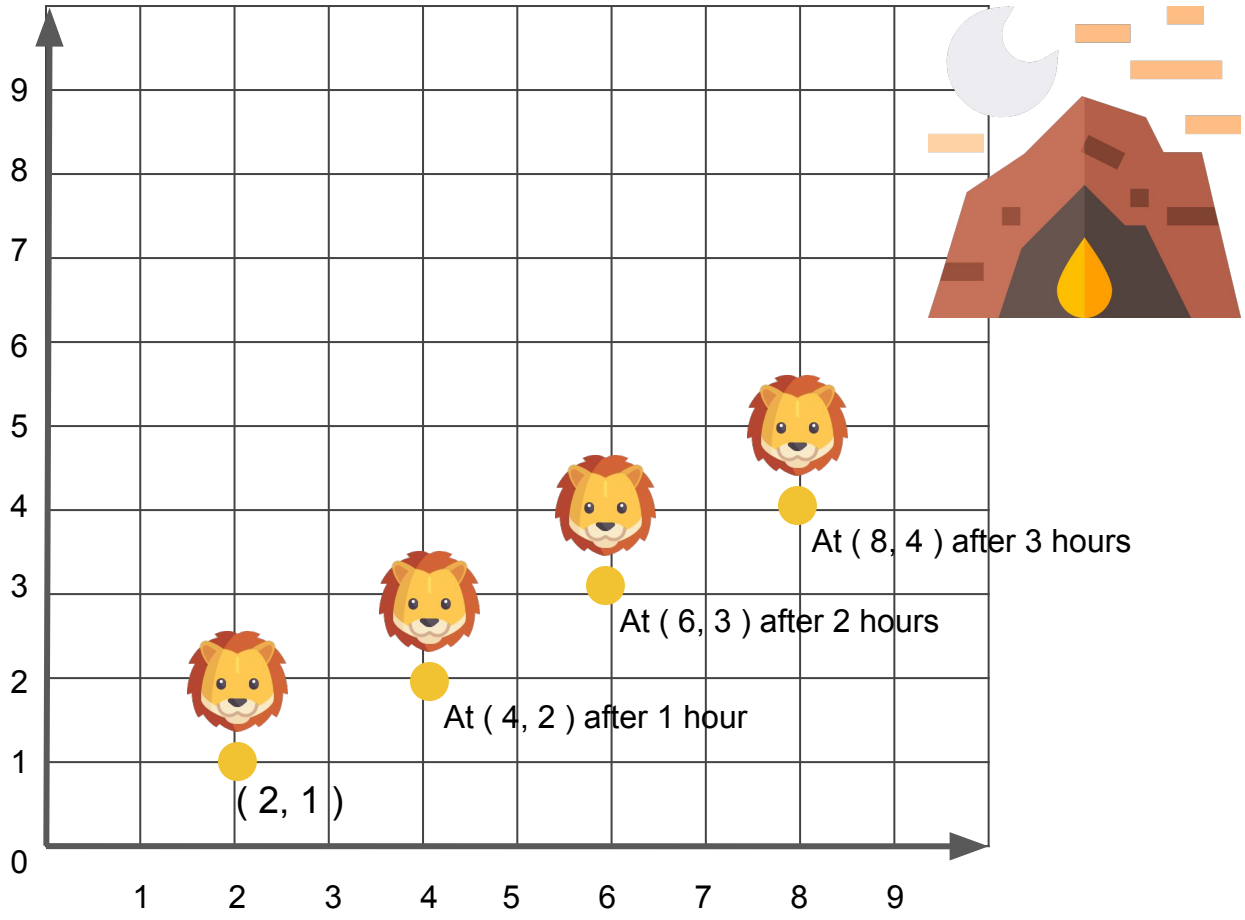
8 ÷ 2 = 4 ⟹ **4** indicates the x-coordinate of the location of the new antique shop.

Based on the graph, the location of the Spring Town and the Alpine Street have the same y- value or y- coordinate which is 5. Therefore, the y-coordinate of the location of the new antique shop must also be 5.

Final answer: The location of the new shop is at (4, 5).

COORDINATE PLANE IN LIFE

A group of zoologists had attached a tracking device to a pregnant lion. By this way, they can monitor the whereabouts of the wild animal before it gave birth. They noticed that the pregnant lion is constantly moving one unit up and two units towards right per hour on the the grid map. If the current location of the lion is at (2,1), where it will be located after 3 hours?

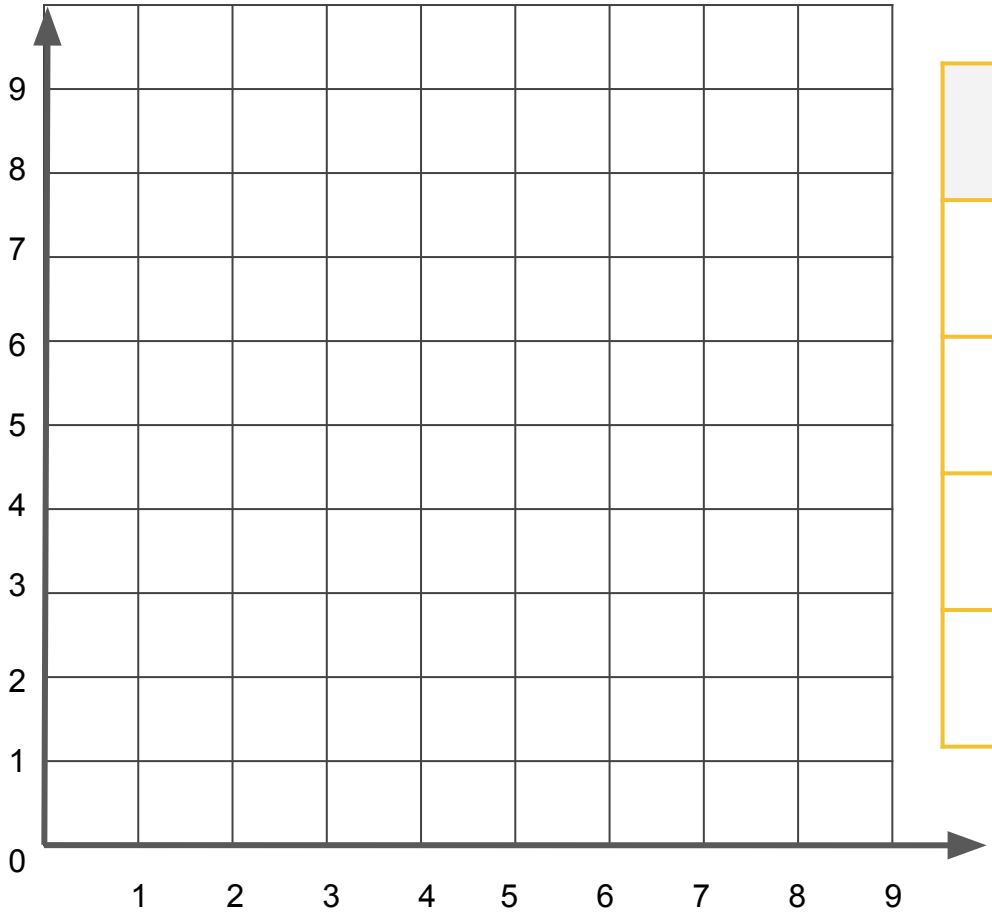


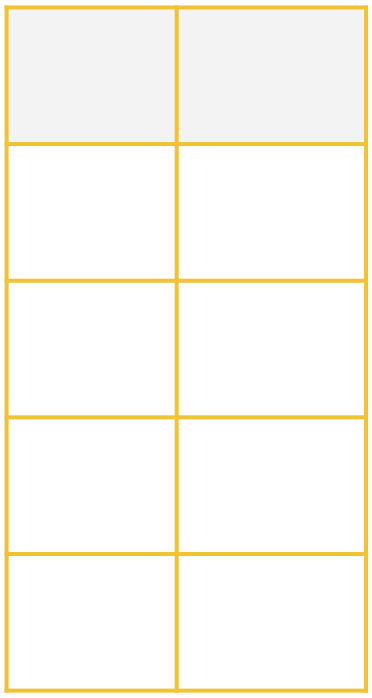
To track the location of the lion, just add 1 to the x-coordinate and 2 to the y-coordinate per hour as it says that “the pregnant lion is constantly moving one unit up and two units towards right per hour”.

Thus, the pregnant lion is at (8,4) after 3 hours.

PRACTICE EXERCISE

If the pregnant lion is at the origin today, where it will be located after 4 hours if it maintains its constant movement? Make a table for your findings.





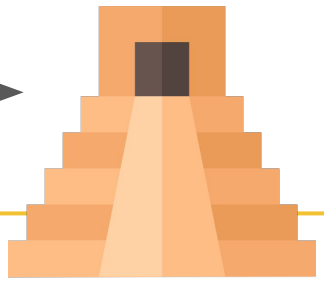
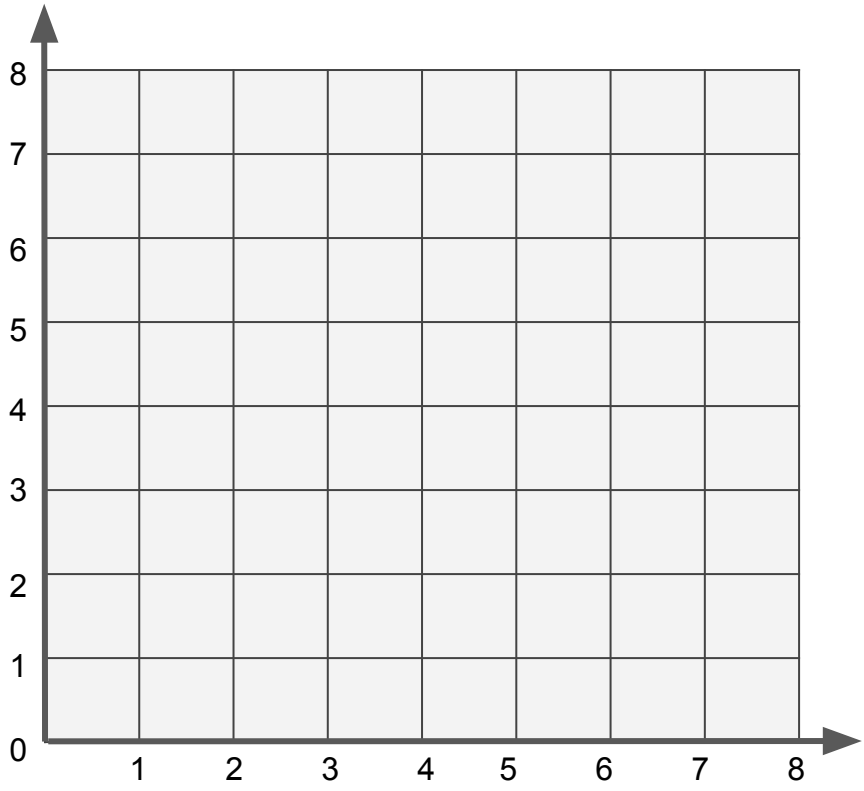


TABLE OF ACTIVITIES

1. Historical Events
2. Sand Clock
3. The Torah Scrolls
4. The Mystery of Hieroglyphics
5. The Great Sphinx of Giza
6. Experience the Pantheon
7. Great Wall of China
8. Moai Statues
9. The Colonizers' Barque
10. The Lost Papyrus

HISTORICAL EVENTS

The class is off to a popular museum to learn about fossils and historical events. Get a one-time pass by plotting these points and determining the length of the line segment produced.



1. A (3, 1)
   B (3, 4)

2. C (4, 0)
   D (8, 0)

3. E (7, 2)
   F (7, 8)

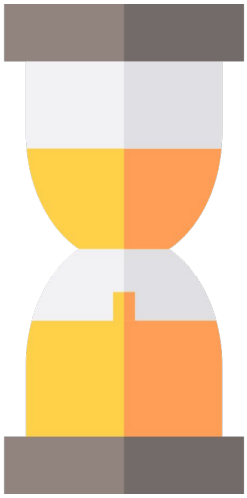
4. G (0, 5)
   H (0, 7)

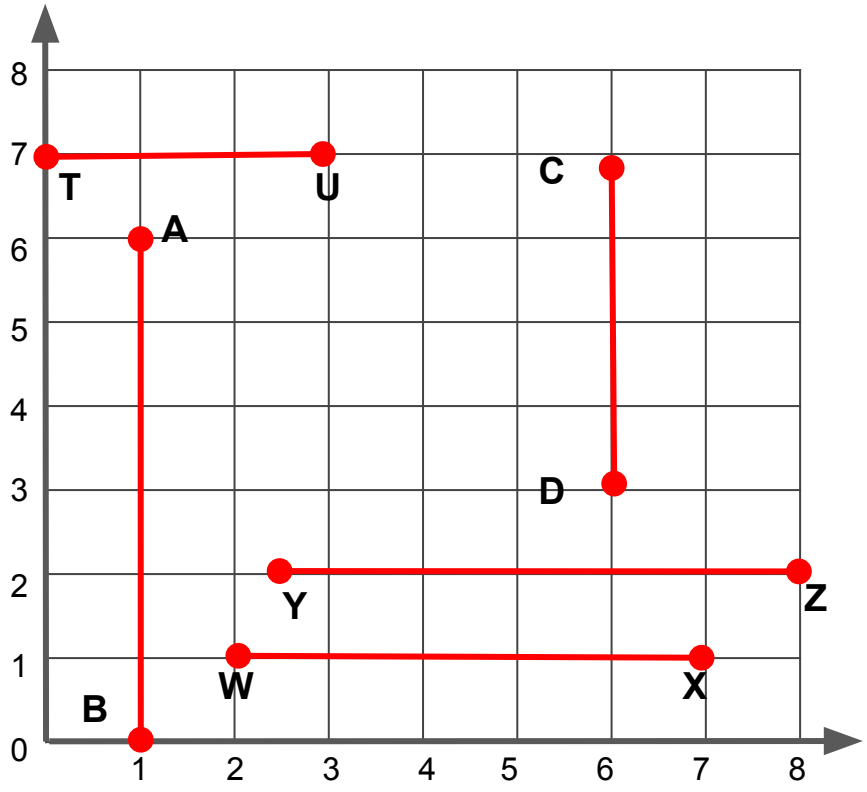
5. I (2, 2)
   J (2, 6)

Your solutions here:

SAND CLOCK

List down the coordinates of the endpoints of each line segment and its given length. Make sure to accomplish your task before the sand of the clock run out.



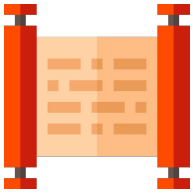


POINT	COORDINATES	LENGTH
1.		
2.		
3.		
4.		
5.		

THE TORAH SCROLLS

Find out what is written on the Torah Scrolls by solving for the missing coordinates.

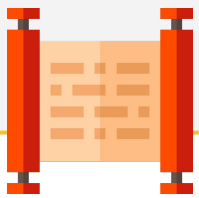
1. A line segment measures 10 units. If the other end of the segment is at the origin, where is the other end located?



2. Christopher ran a total of 8 km in 1 hour. On a grid map, his starting point is at (3, 5). Where was he located during his 30th minute of running if a unit is equal to 1 km and he is running towards the right direction?

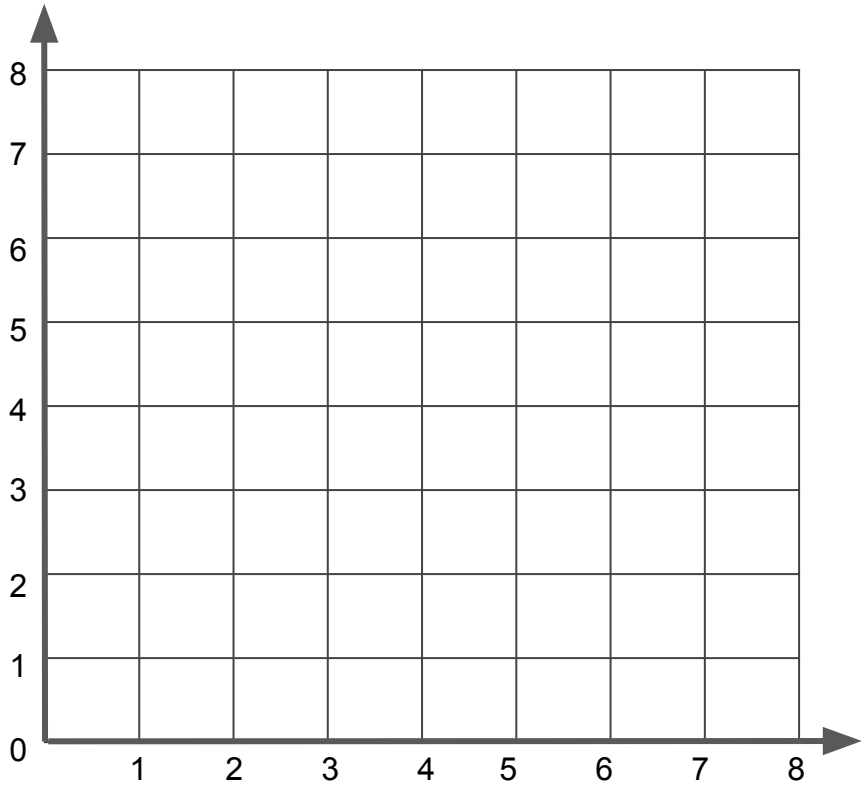
3. Alice is required to trim the lawn ¼ of its size everyday. The lawn formed a straight line starting at (5, 2). If a unit is equivalent to ¼ trimmed lawn, what is the location of the lawn to be trimmed at the 3rd day?

4. If the other end of a segment drawn horizontally is at (0,10), where is the other end located if the line segment measures 5 units?



THE MYSTERY OF HIEROGLYPHICS

What do these hieroglyphs mean? Unlock it by dealing with squares on coordinate plane.

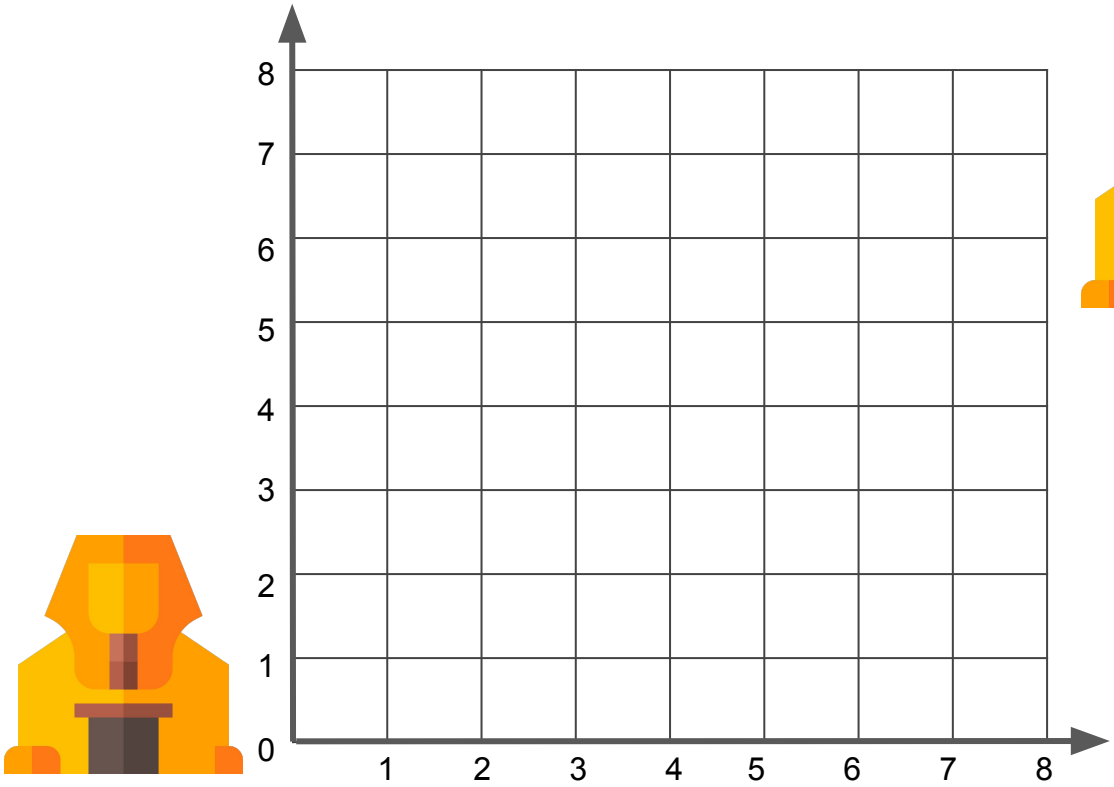


1. Draw square ABCD whose side measures 3 units. List down the coordinates of the vertices.

2. A side of square HWMT measures 4 units. The other end is at (4,1). Where are the other vertices located?

THE GREAT SPHINX OF GIZA

The Great Sphinx of Giza on the west bank of the Nile River is one of a kind historical structure. Book a ticket to visit it by dealing with rectangles on coordinate plane.



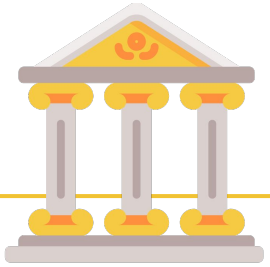
1. Draw a rectangle on the coordinate plane with an area of 8 sq. units. Shade the covered region with yellow color.

2. Construct a rectangle on the coordinate plane whose perimeter is 12 units. List down the coordinates of the vertices.

EXPERIENCE THE PANTHEON

Experience the UNESCO World Heritage Site in Central Rome --- Pantheon. Book a one-day discounted trip by solving the following problems.

1. Henry is heading to nearby museum. He drove 3.5 miles towards east and another 3.5 miles north to reach his destination. Based on the grid map, his starting location is at (4, 6). What is now his new location on the grid map if each mile is equal to 1 unit?



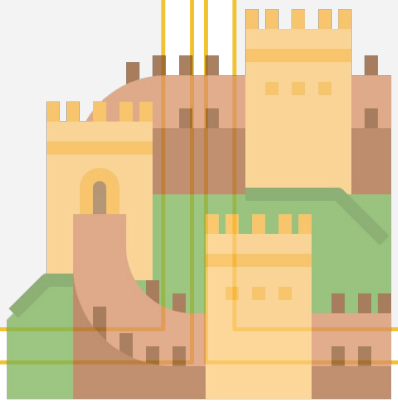
2. Henry is driving again to visit his friends on the other town. Starting from the museum, let the location be at (6, 0), he headed to his first stop over at (13.5, 0), second stop over at (13.5, 5) and lastly at (20, 5). If a unit is equal to 0.5 miles, what is the total distance he travelled?

GREAT WALL OF CHINA

One of the famous man-made structures was the Great Wall of China. Come and visit this long structure by answering the following problems.

1. HWM Cafe wants to open another franchise halfway between Summer Street and Carnation Town. Summer Street is located at (3,3) on the grid map while Carnation Town is at (11,3). Where should the new franchise shop be located?

2. If a certain building is located at (9, 2) on the grid map, where should the location of other structures be if a bookstore is 12 units right away from the building and a pet shop is located 8 units above the building?



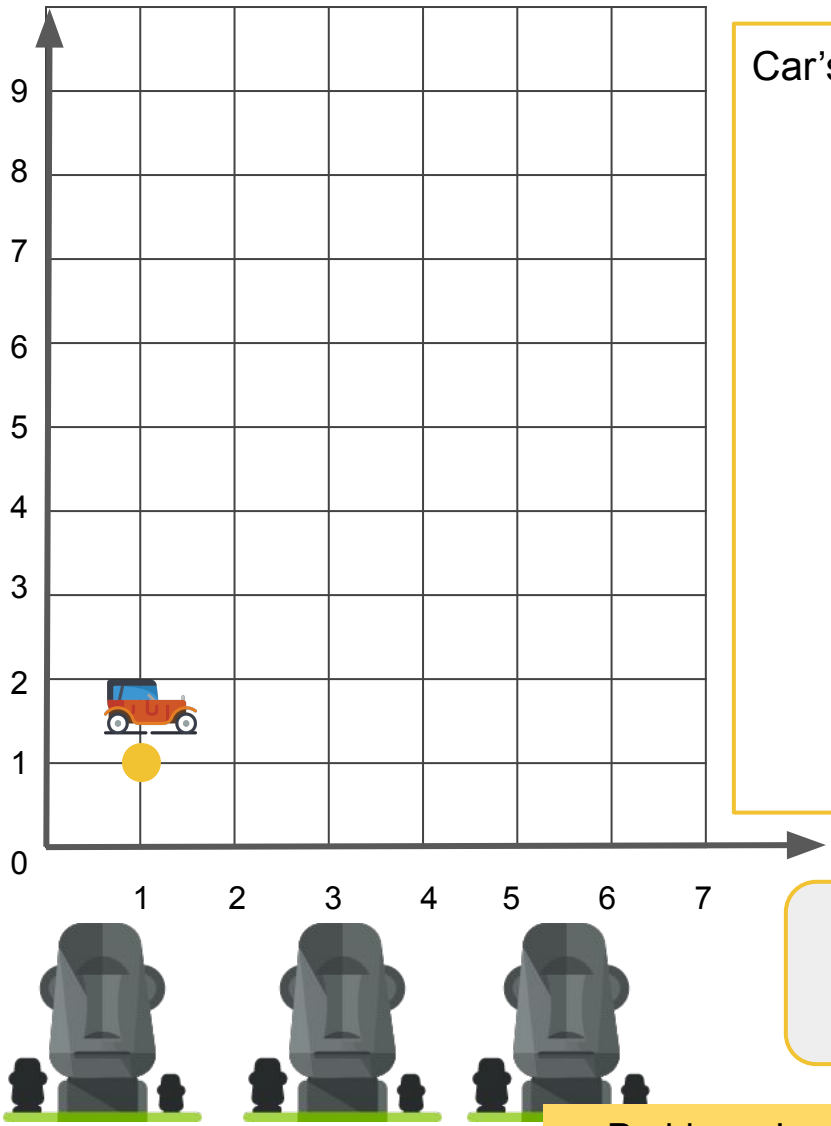
MOAI STATUES

Get amazed with these Moai Statues and find out the locations and distance travelled of the given vintage car.

A vintage car has installed a location tracker on its system. It is travelling two units up and a unit to the right every 45 mins. The starting point of the car is at (1,1) and its destination is at (5,9).

a. Trace the location of the car every 45 mins. Give its location.

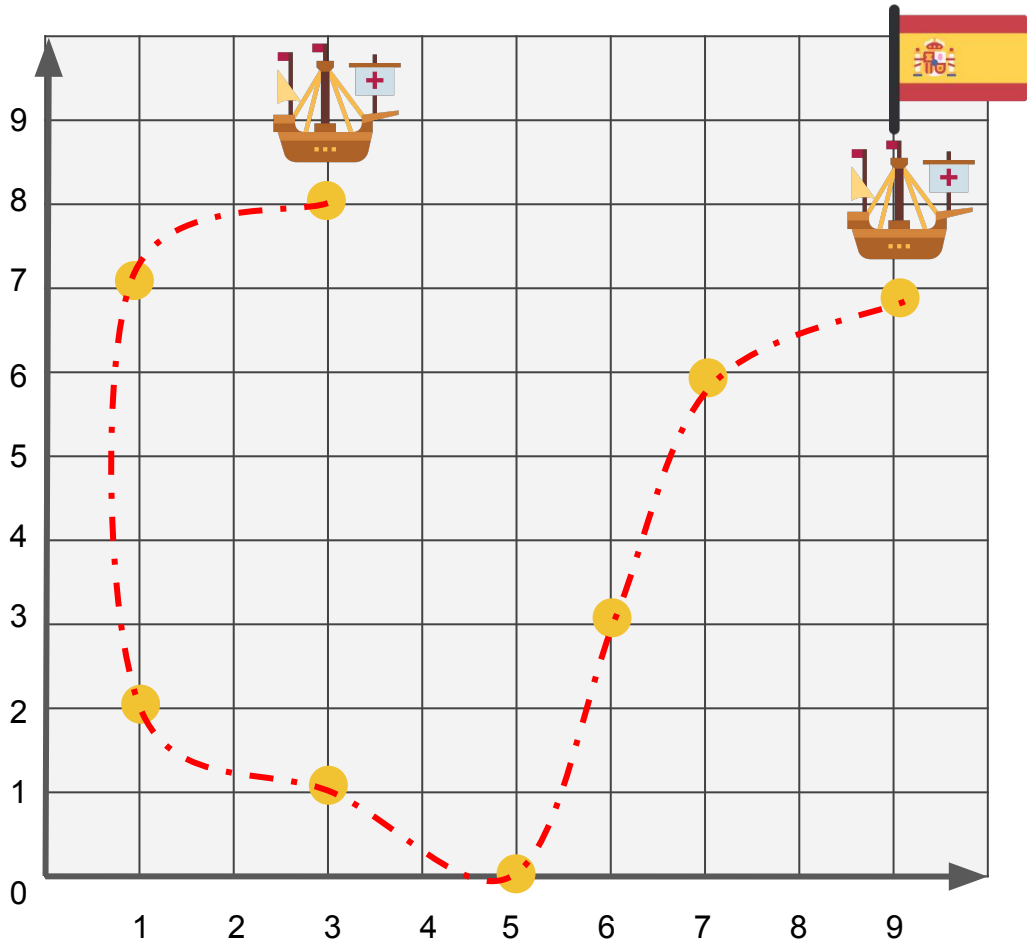
b. How long will it take for the car to reach its destination?



Car's location on the grid map.

THE COLONIZERS' BARQUE

Here comes the Spaniards Barque! Trace the location of the islands that they conquered and list them down on the table provided.

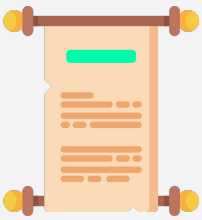


THE LOST PAPYRUS

Find out what's written on the lost papyrus by answering the following questions below.

1. What is the importance of understanding this lesson in your life? Give three life scenarios where this lesson is useful.

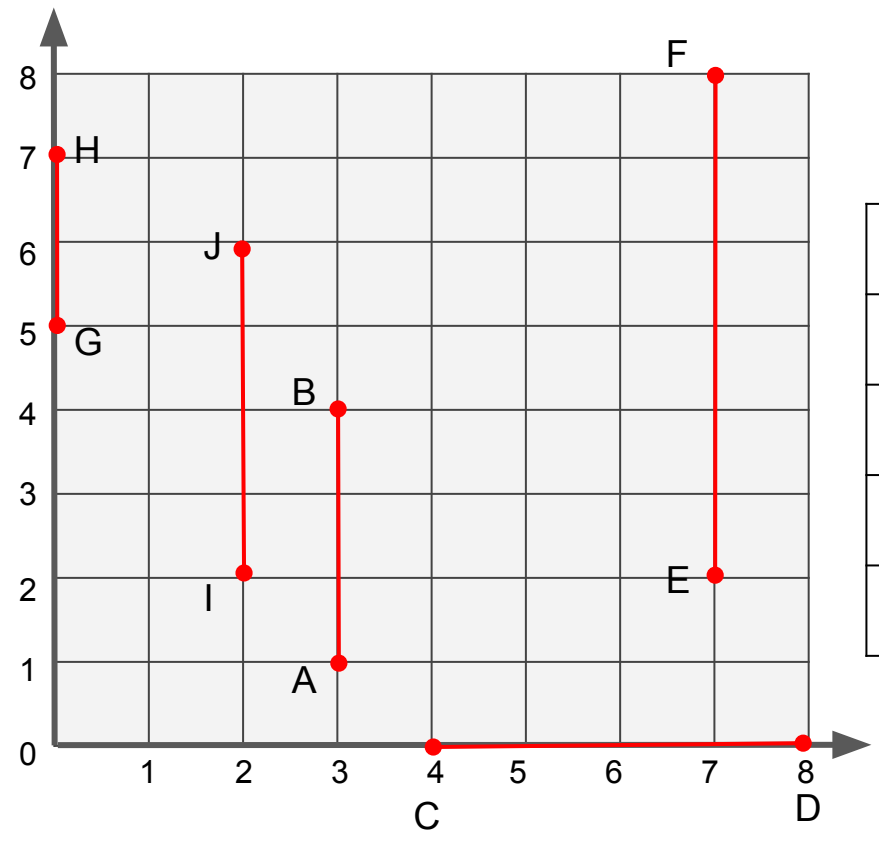
2. Explain how points are being plotted on the coordinate plane.



3. How do we find the distance of two points in this lesson?

ANSWER GUIDE

Activity 1



AB = 3 UNITS
CD = 4 UNITS
EF = 6 UNITS
GH = 2 UNITS
IJ = 4 UNITS

Activity 2

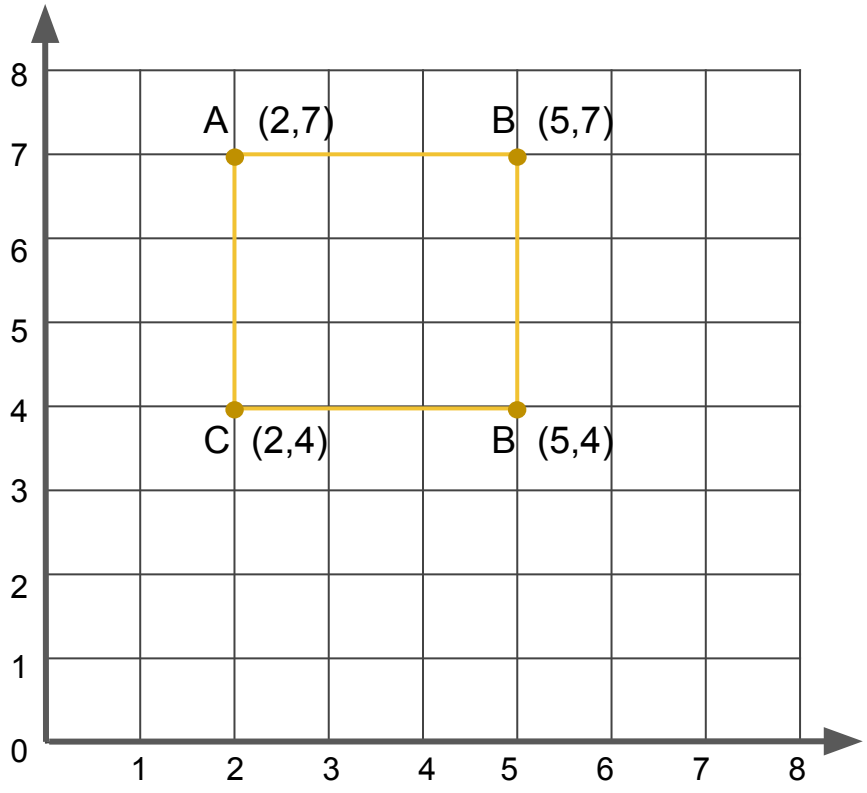
POINT	COORDINATES	LENGTH
1. A and B	(1,6) and (1,0)	5 units
2. C and D	(6,7) and (6,3)	4 units
3. T and U	(0,7) and (3,7)	3 units
4. W and X	(2,1) and (7,1)	5 units
5. Y and Z	(2.5,2) and (8,2)	5.5 units

ANSWER GUIDE

Activity 3

1. Two possible answers: (0,10) or (10,0)
2. (7,4) 3. (8,2) 4. (5,10)

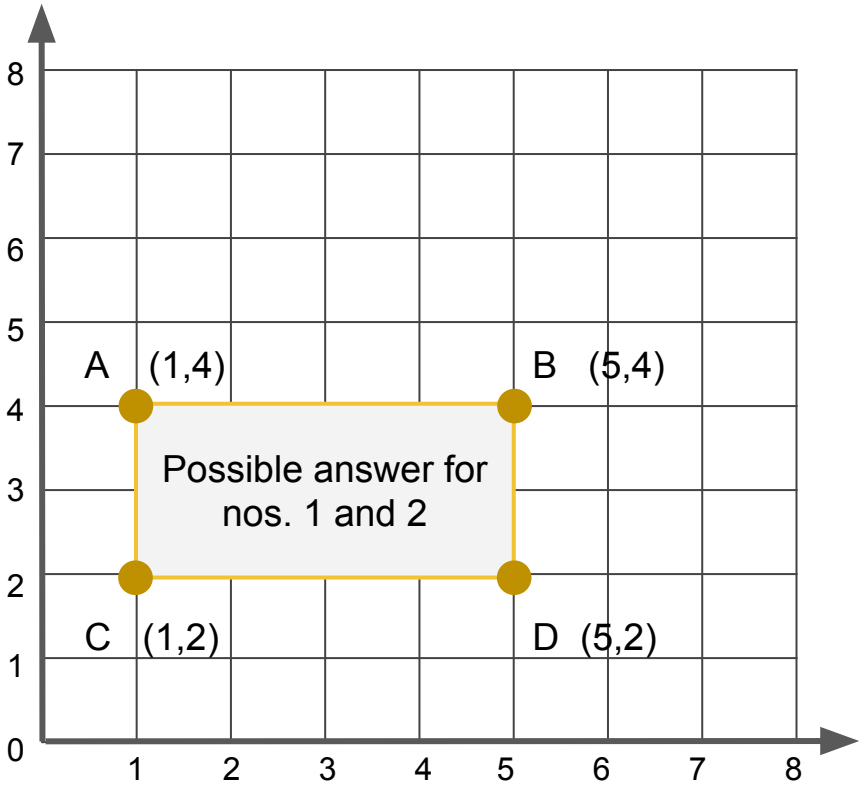
Activity 4



2. H (4,1) W (8,1) M (4,5) T (8,5)

ANSWER GUIDE

Activity 5



Activity 6

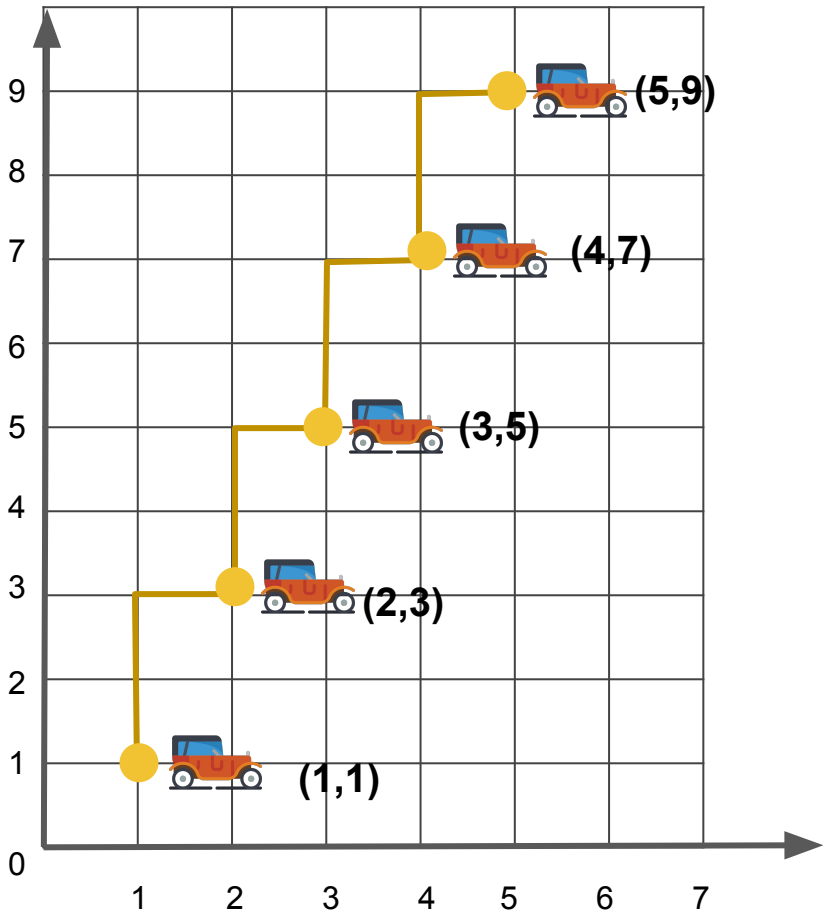
1. New location is at (7.5, 9.5)
2. He travelled a total of 7 miles.

Activity 7

1. The new shop must be built at (7,3).
2. The location of the bookstore should be at (21, 2) while the pet shop must be at (9, 10).

ANSWER GUIDE

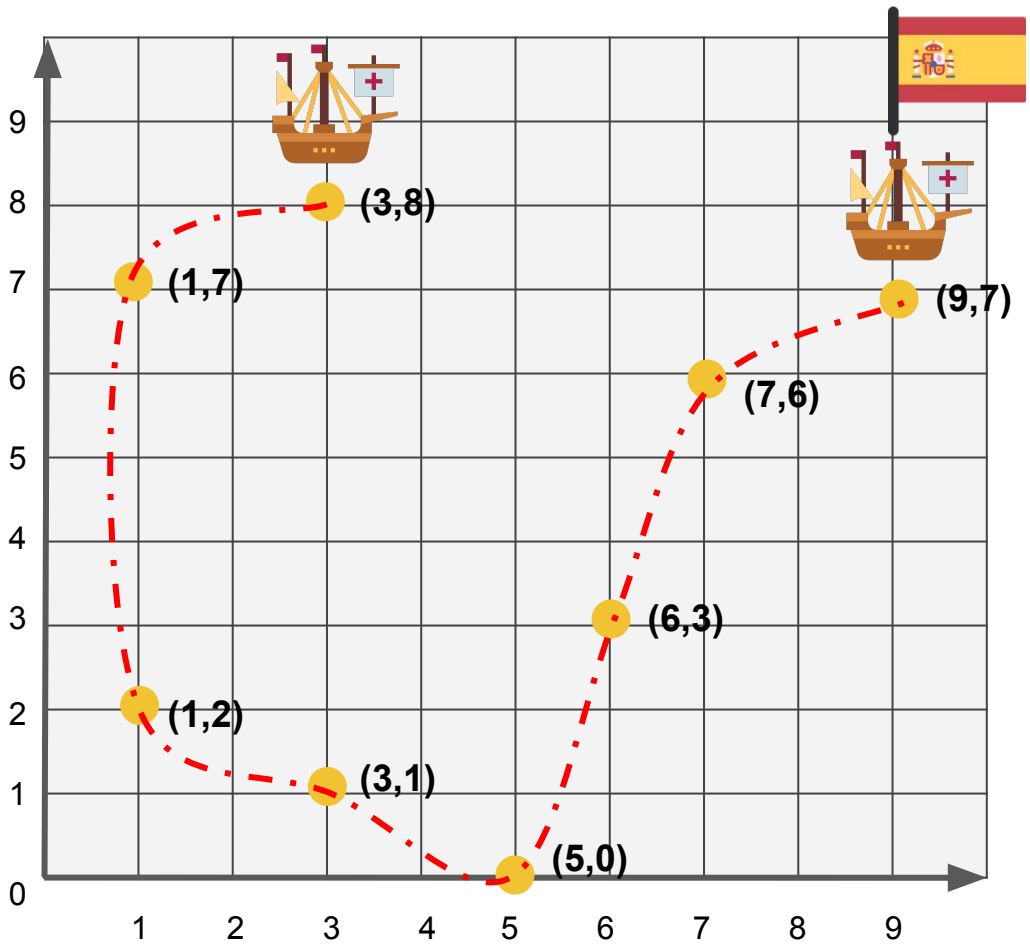
Activity 8



B. It will take 3 hours or 180 minutes for the vintage car to reach its destination.

ANSWER GUIDE

Activity 9



Activity 10

1. Answers may vary.
2. Locate the x-coordinates first then the y-coordinates.
3. Just subtract either the x or y- coordinates.

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