

# Graphing Points on the Coordinate Plane

by Sophia



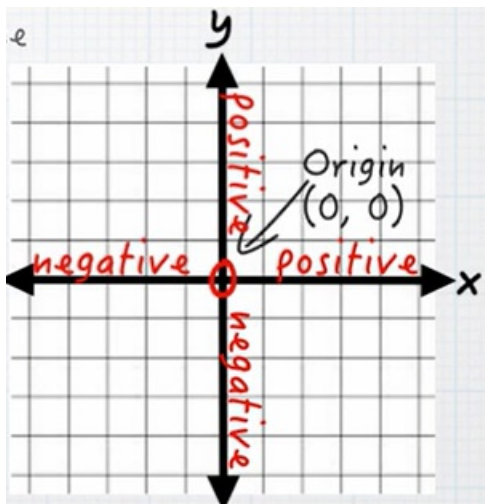
## WHAT'S COVERED

This tutorial covers graphing points on a coordinate plane, through the exploration of:

## 1. Coordinate Plane

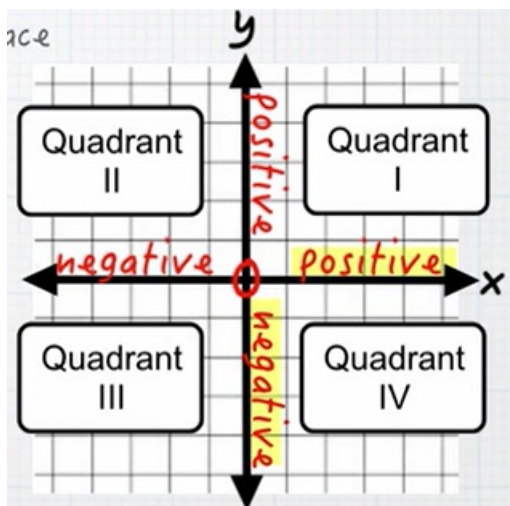
The **coordinate plane** is a two-dimensional surface used to plot and identify points. It consists of a horizontal number line called the x-axis and a vertical number line called the y-axis.

Both the x-axis and the y-axis have a positive and negative side and both have a center at 0. The centers of the x- and y-axes intersect at a point in the coordinate plane called the origin. The origin is at 0 on both the x-axis and the y-axis.



The x- and y-axes divide the coordinate plane into four quadrants:

- In quadrant 1, x and y are both positive.
- In quadrant 2, x is negative and y is positive.
- In quadrant 3, x and y are both negative.
- In quadrant 4, x is positive and y is negative.



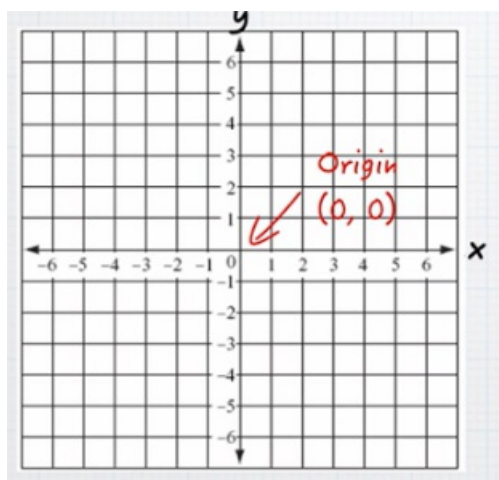
#### TERM TO KNOW

### Coordinate Plane

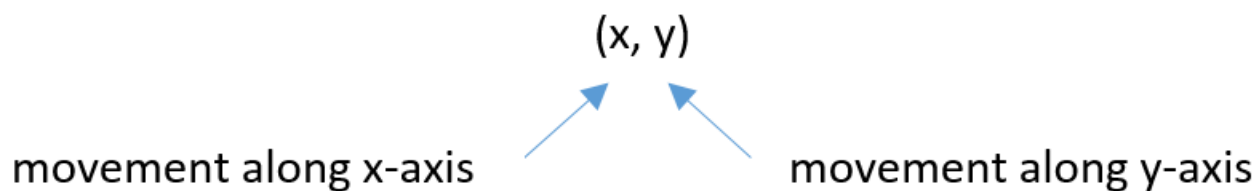
A two dimensional surface used to plot and identify points

## 2. Coordinate Points

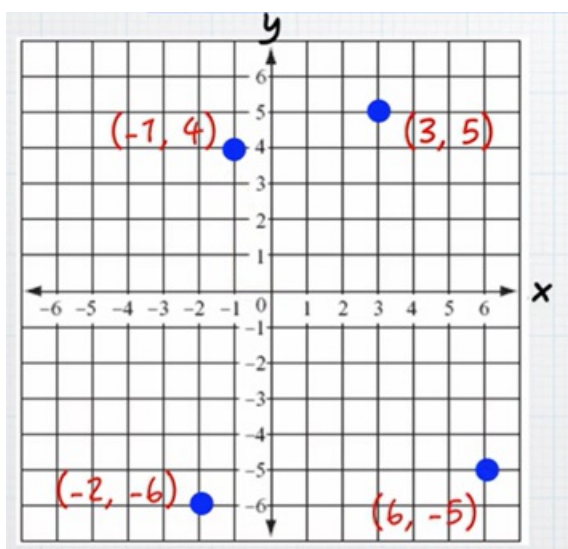
All points on the coordinate plane can be indicated by an x value and a y value. These two values form a coordinate pair, which is written as  $(x,y)$ . The point at the origin is represented by the coordinate pair  $(0, 0)$ .



Starting at the origin, the first coordinate indicates how far to move in the horizontal direction along the x-axis. The second coordinate indicates how far to move in the vertical direction along the y-axis.



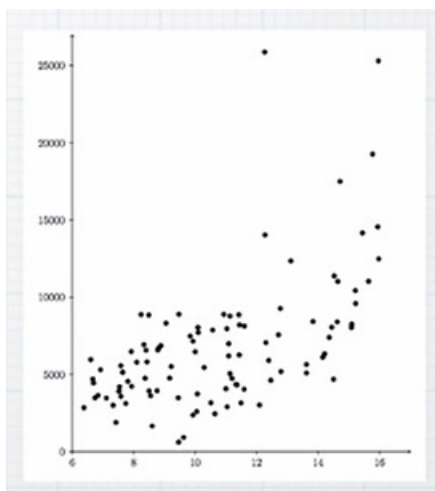
The coordinate plane below illustrates different ordered pairs in each quadrant:



- The ordered pair (3,5) is 3 units in the positive x direction and 5 units in the positive y direction from the origin. It's also the point where x is 3 and y is 5.
- The ordered pair (-2, -6) is 2 units in the negative x direction from the origin and 6 units in the negative y direction from the origin. It is also the point where x is -2 and y is -6.
- The ordered pair (-1, 4) is 1 unit in the negative x direction and 4 units in the positive y direction. It's also the point where x is -1 and y is 4.
- The ordered pair (6, -5) is 6 units in the positive x direction and 5 units in the negative y direction. It's also the point where x is 6 and y is -5.

### 3. Scatterplots

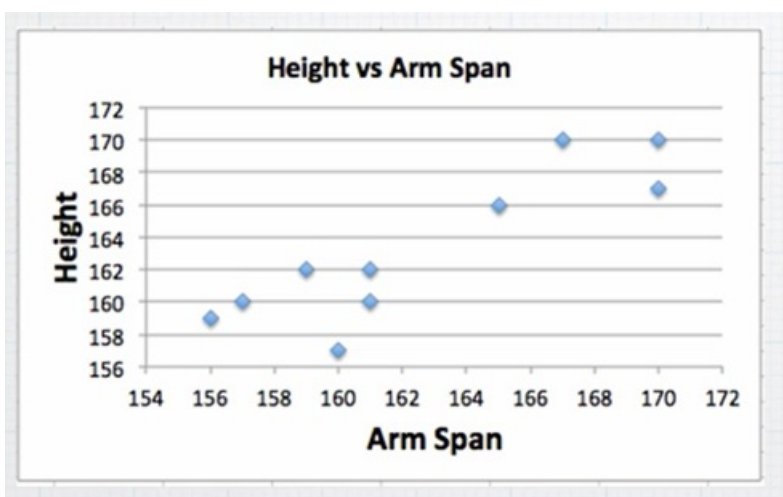
A scatterplot or scatter diagram is a certain type of graph. A **scatter diagram** is the collection of points on the coordinate plane used to represent data. Coordinate points in ordered pairs in scatter diagrams form a relationship between two variables.



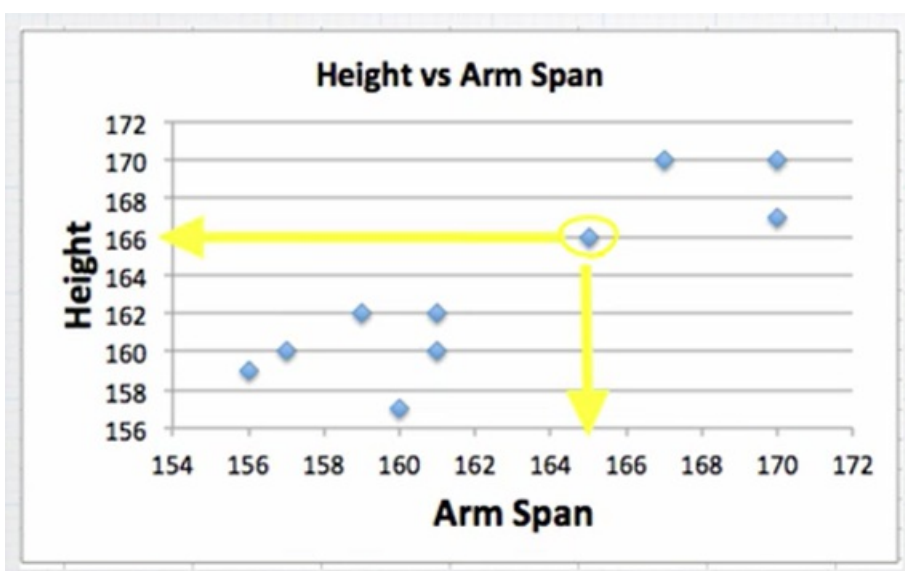
Scatter diagrams are used to display various types of data in science, psychology, sociology, and statistics. Being able to read and interpret graphical information is important in these areas of study.

➞ **EXAMPLE** In the scatterplot below, the arm spans and heights of 10 people were measured, and the data was plotted on the scatter diagram. The x-axis represents the values of the x variable, arm

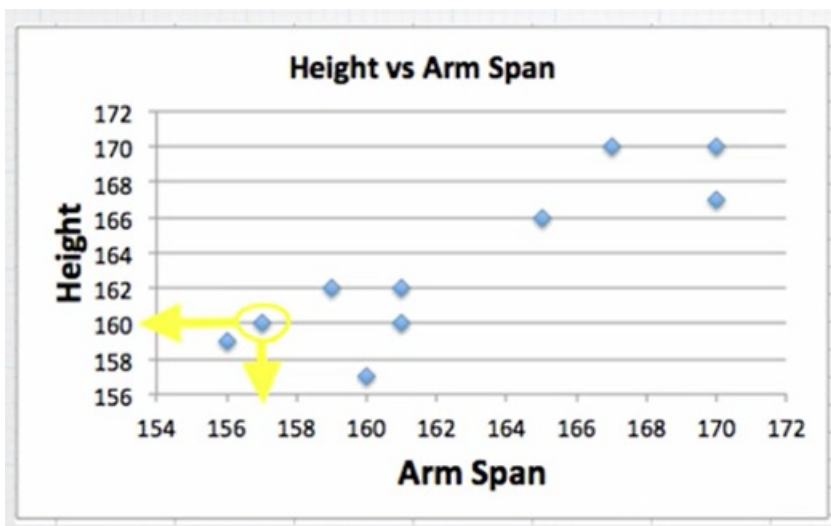
span, which was measured in centimeters, and the y-axis represents the values of the y variable, height, which was also measured in centimeters. Each point on the graph represents the arm span and height for one person.



For instance, the circled point below represents the person who had an arm span of 165 centimeters and a height of 166 centimeters.



The point below represents a person who had an arm span of 157 centimeters and a height of 160 centimeters.

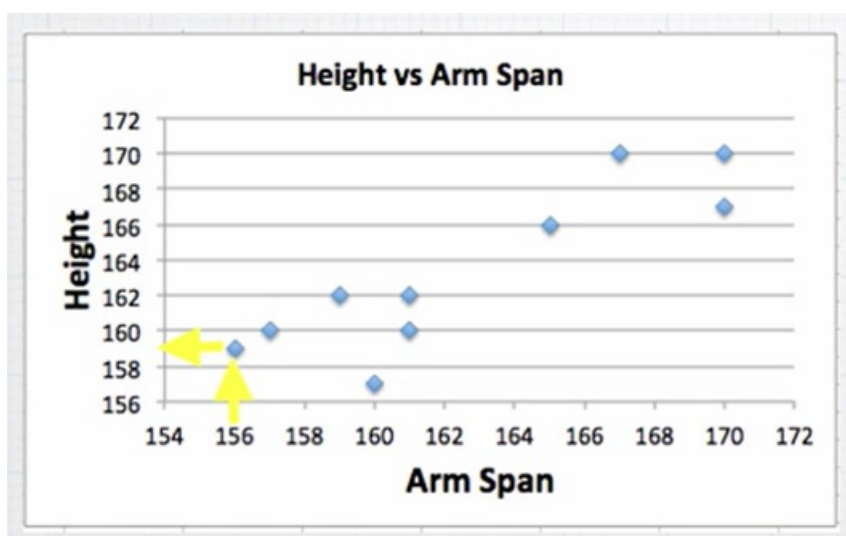


Use the same scatter plot as above.

**Determine the height of the person with an arm span of 156 centimeters.**

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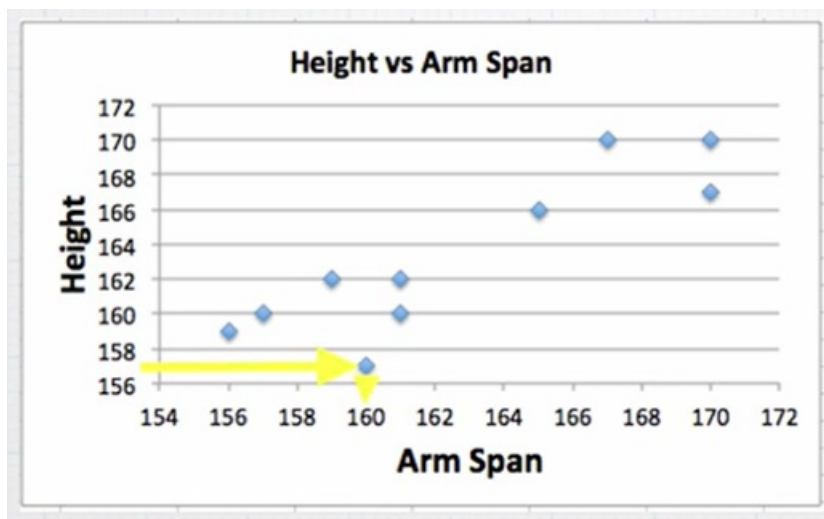
First, identify the point where the x value is 156. You can see that this point has a y value of 159 centimeters. Therefore, the person with the arm span of 156 centimeters has a height of 159 centimeters.



**Determine the arm span of a person with a height of 157 centimeters.**

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Identify the point where the y value (height) is 157 and you can see that this point has an x value of 160. Therefore, this person's arm span is 160 centimeters.



#### TERM TO KNOW

##### Scatter Diagram

A collection of points in the plane used to represent data



#### SUMMARY

Today you learned that the **coordinate plane** consists of a horizontal number line called the x-axis and a vertical number line called the y-axis, which intersect at a point in the coordinate plane called the origin. You also learned that the point of the origin is represented by the coordinate pair  $(0, 0)$ . Lastly, you learned that a **scatterplot** or scatter diagram is a collection of **coordinate points** in the coordinate plane used to represent data, which can be analyzed.

Source: This work is adapted from Sophia author Colleen Atakpu.



#### TERMS TO KNOW

##### Coordinate Plane

A two dimensional surface used to plot and identify points.

##### Scatter Diagram

A collection of points in the plane used to represent data.