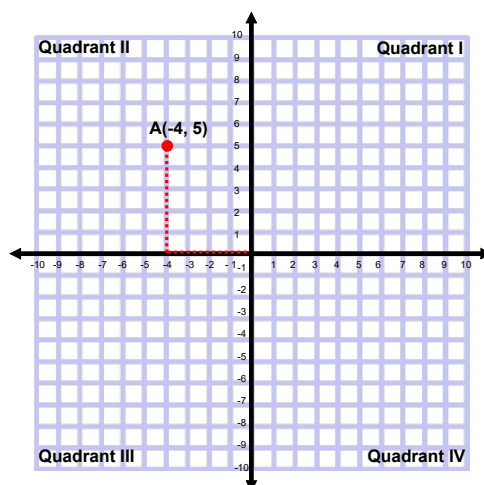*The coordinate plane is also known as the*
Cartesian Plane *named after French*
mathematician Renee Descartes.

The horizontal and vertical axis divide the plane
into four **quadrants***.*

The point where the horizontal and vertical
axis intersect is known as the **origin***.*

In a relation, the **independent** *variable is found along the horizontal axis*
and the **dependent** *variable is found along the vertical axis.*

The **ordered pairs** *of numbers that identify any point on the graph is* (x, y)*.*
The ordered pair (coordinates) that represent the origin are **$(0, 0)$***.*

A **dot** *is used to represent a point on the graph. An* **upper-case letter** *is used*
*to name the point.*

MTH1W Grade 9 Mathematics

4.1 Working with Ordered Pairs

Goal(s)   *- To write the coordinates of a point shown on a graph.*
- To plot a given point on the Cartesian plane.
- To determine if a point satisfies a relation by looking at a graph or
substituting the point into the equation; explain what it means for a point to
satisfy an equation.

Ordered pairs or coordinate pairs are **'directions'** used to plot a point on the graph. The value of the independent variable indicates horizontal movement (right / left), and the value of the dependent variable indicates vertical movement (up / down).

For example, the coordinate pair *(3, 8)* indicates a movement of *3* units right of the origin and then *8* units upwards.
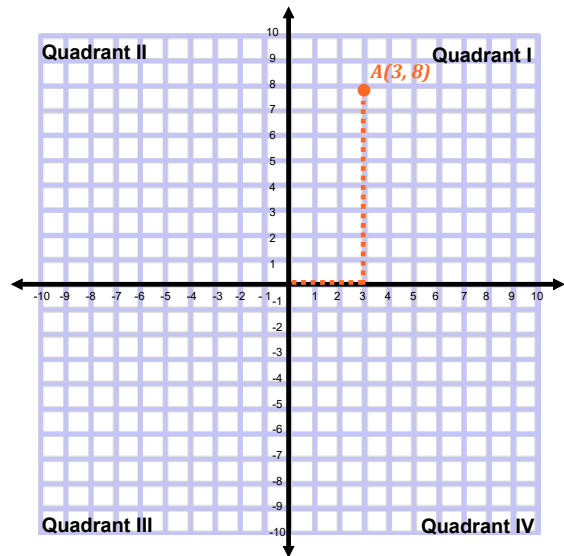
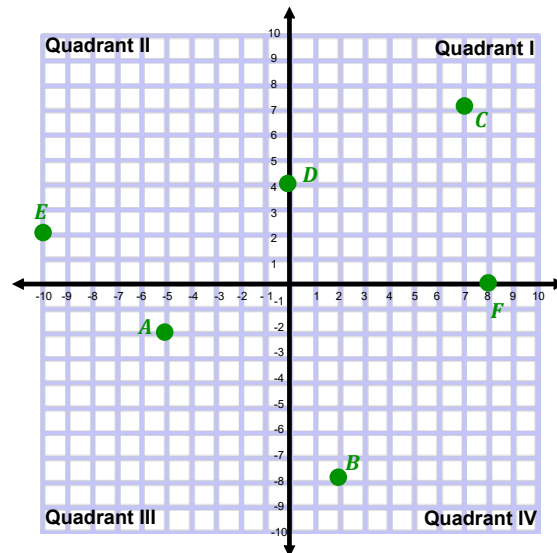State the coordinates of each point on the graph.

A $(-5, -2)$

B $(2, -8)$

C $(7, 7)$

D $(0, 4)$

E $(-10, 2)$

F $(8, 0)$

2

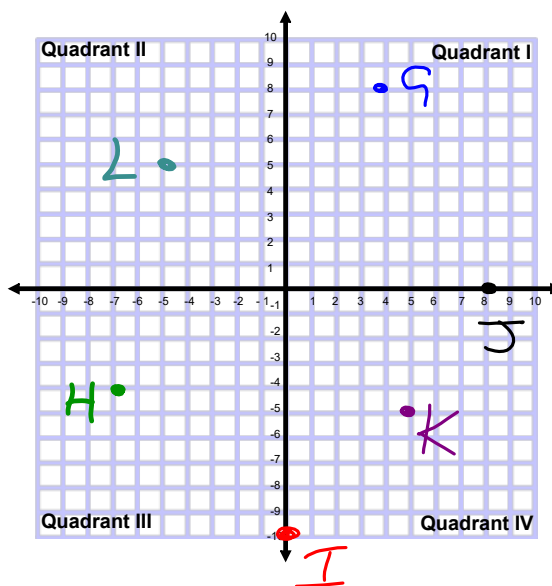Plot each of the following points on the Cartesian plane.
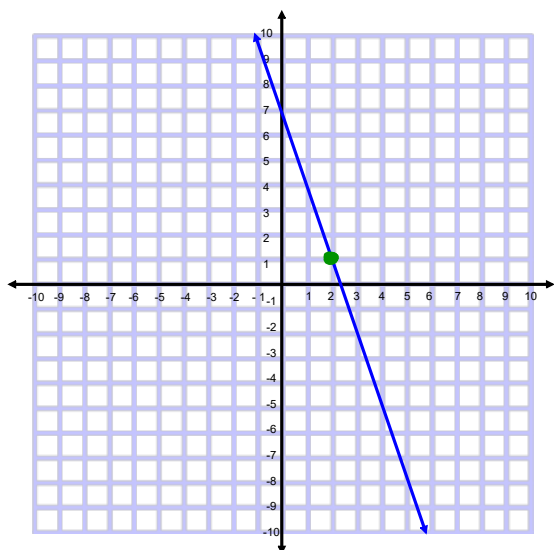
G (4, 8)

H (-7, -4)

I (0, -10)

J (8, 0)

K (5, -5)

L (-5, 5)

The linear relation, $y = -3x + 7$, is shown on the graph. Does the point (2, 1) **satisfy** this relation? Explain how you know.

Yes it does, because the point (2,1) is on the line.

A point **satisfies** a relation if it is found on the graph of the relation. It can also be determined *algebraically* by substituting the values of point *(x, y)* into the equation of the relation and simplifying.
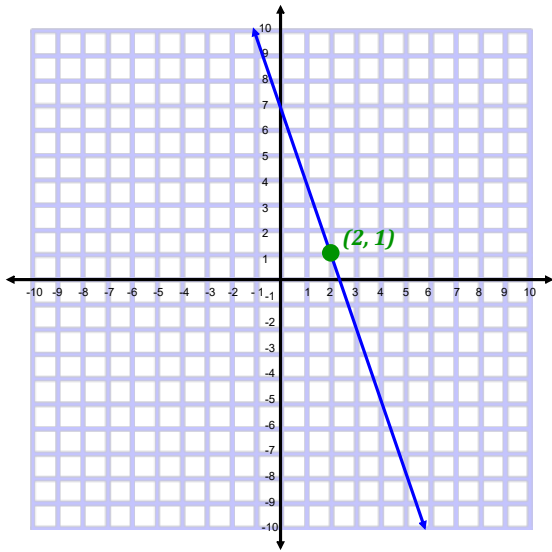
y = -3x + 7

LS = *y*   RS = *-3x + 7*

Sub in $x = 2$ and $y = 1$

$$\Rightarrow 1 = -3(2) + 7$$
$$1 = -6 + 7$$
$$1 = 1 \checkmark$$

As the LS = RS the point satisfies the relation

The point *(x, -13)* lies on the graph of the linear relation, *y = 4x + 7*. Determine the value of *x*.

$$y = 4x + 7$$

Sub in $y = -13$ $(x, -13)$
                                            $\uparrow$
$$-13 = 4x + 7$$ y-value
$$-13 - 7 = 4x + 7 - 7$$
$$\frac{-20}{4} = \frac{4x}{4}$$
$$-5 = x$$