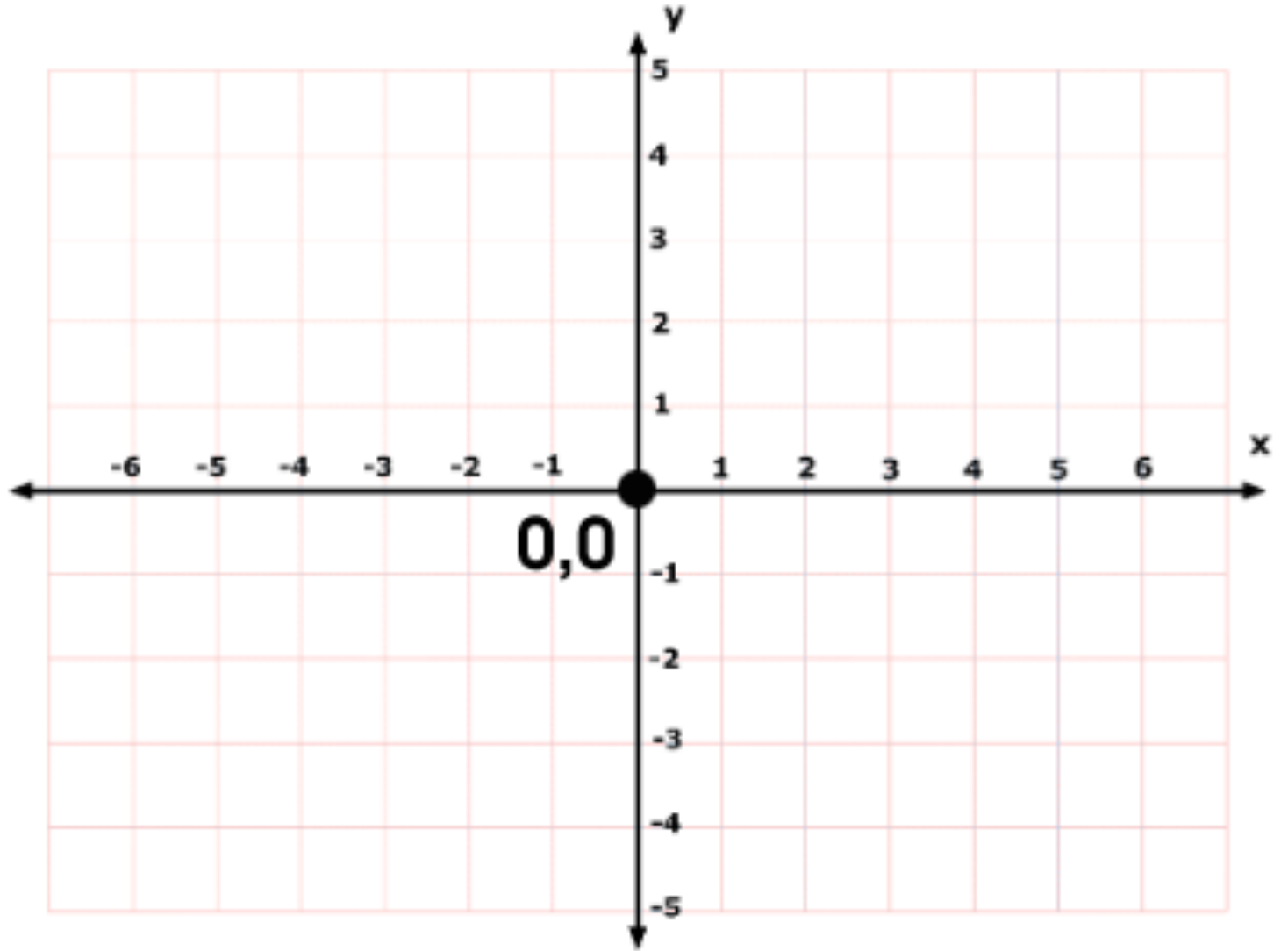


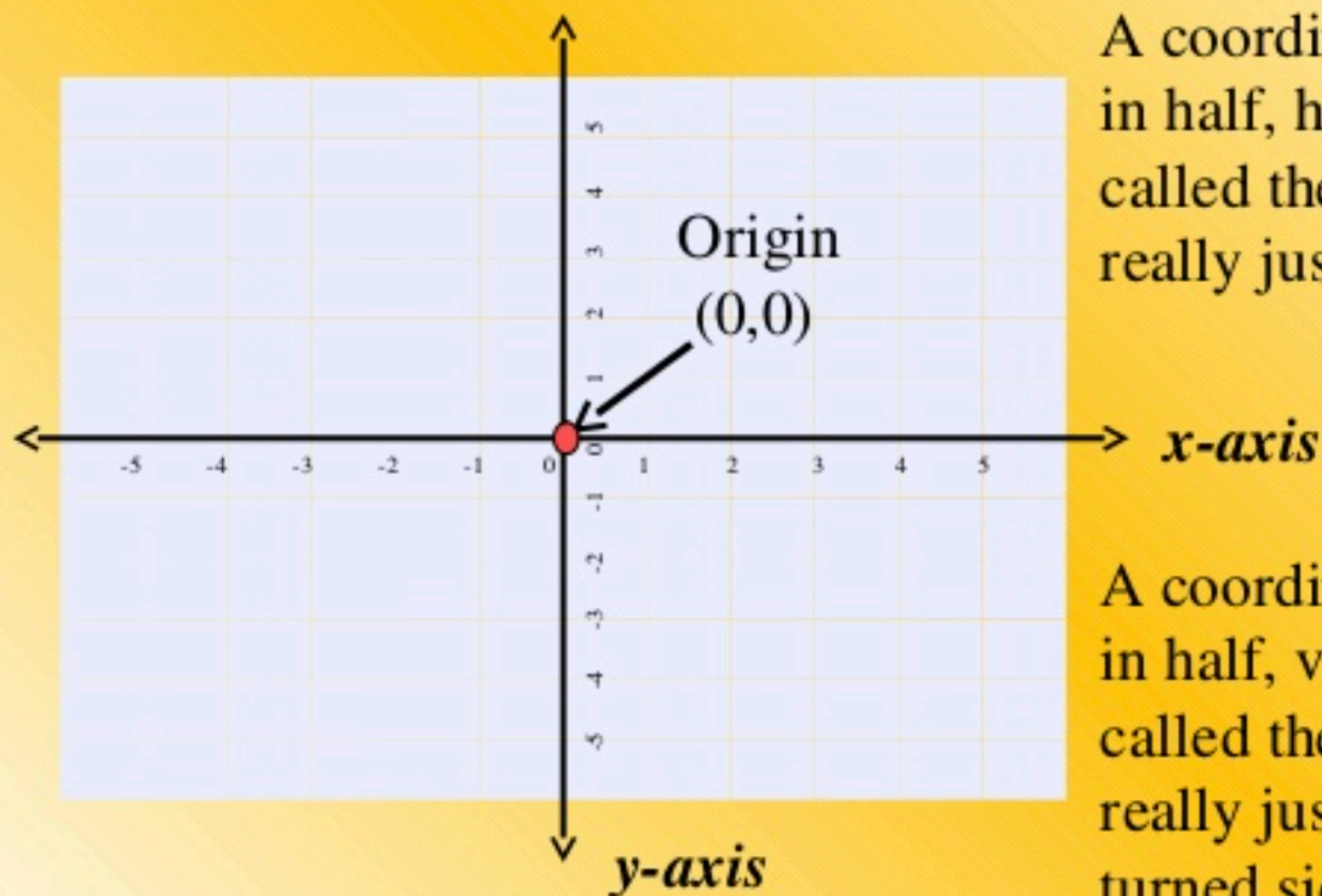
Day 8:
Systems of Equations,
The Coordinate Plane
and Simple Graphs



The Coordinate Plane



Coordinate Plane



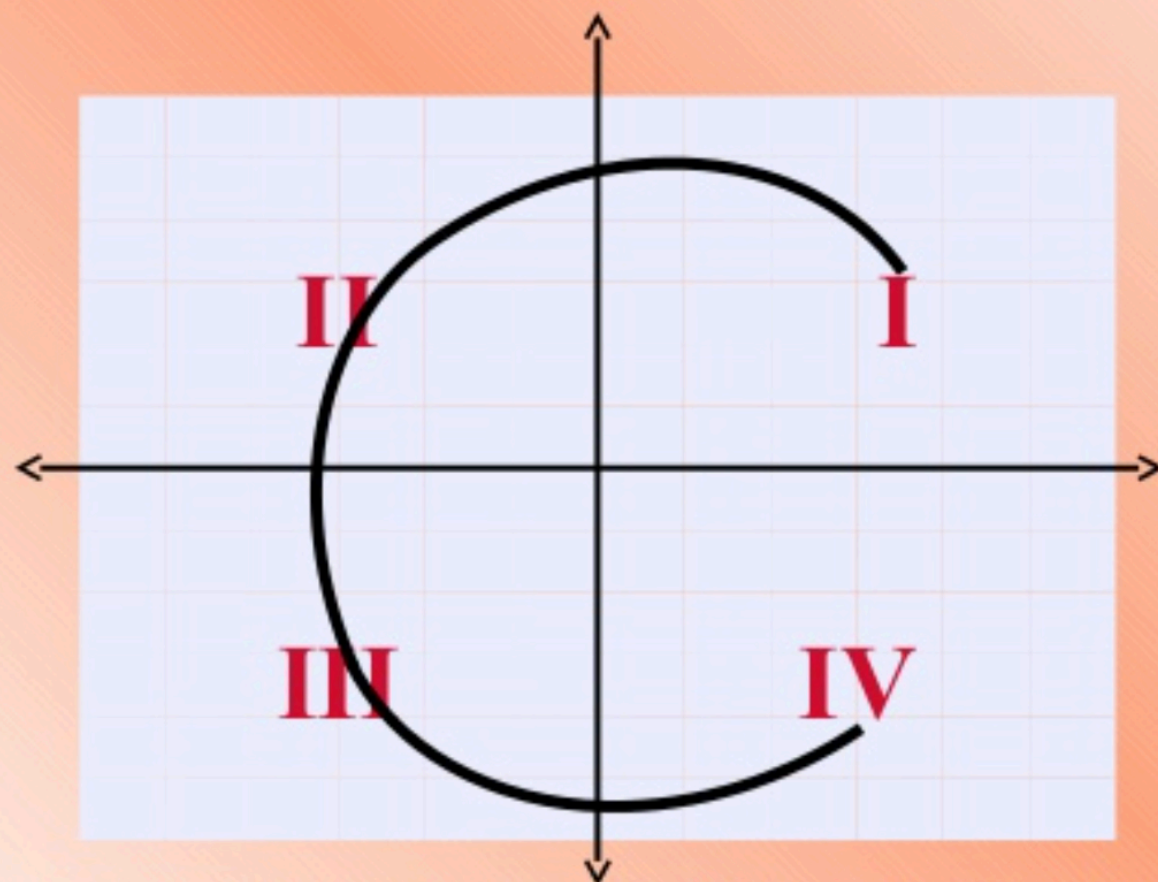
A coordinate plane is divided in half, horizontally, by a line called the *x-axis*, which is really just a number line.

A coordinate plane is divided in half, vertically, by a line called the *y-axis*, which is really just a number line turned sideways.

The axes intersect at, the origin, the zero point on both number lines.
The axes divide the plane into four regions or quads.

The four regions created by the x and y axis are called quadrants.

They are labeled using roman numerals in a counterclockwise direction starting in the upper right hand corner.



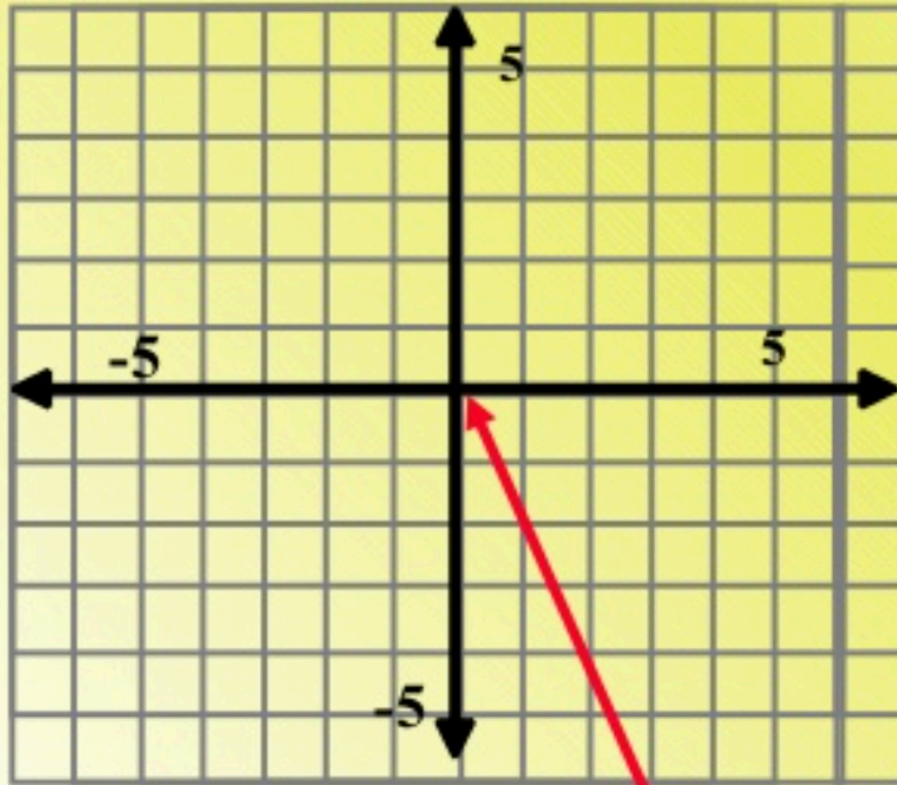
The “C” which could stand for coordinate plane or counterclockwise will help you remember which way to label your plane.

Ordered pairs are used to locate points in a coordinate plane.

What order do they go in? **x comes first and then y; (x,y)**

How am I going to remember that?

y-axis (vertical axis)



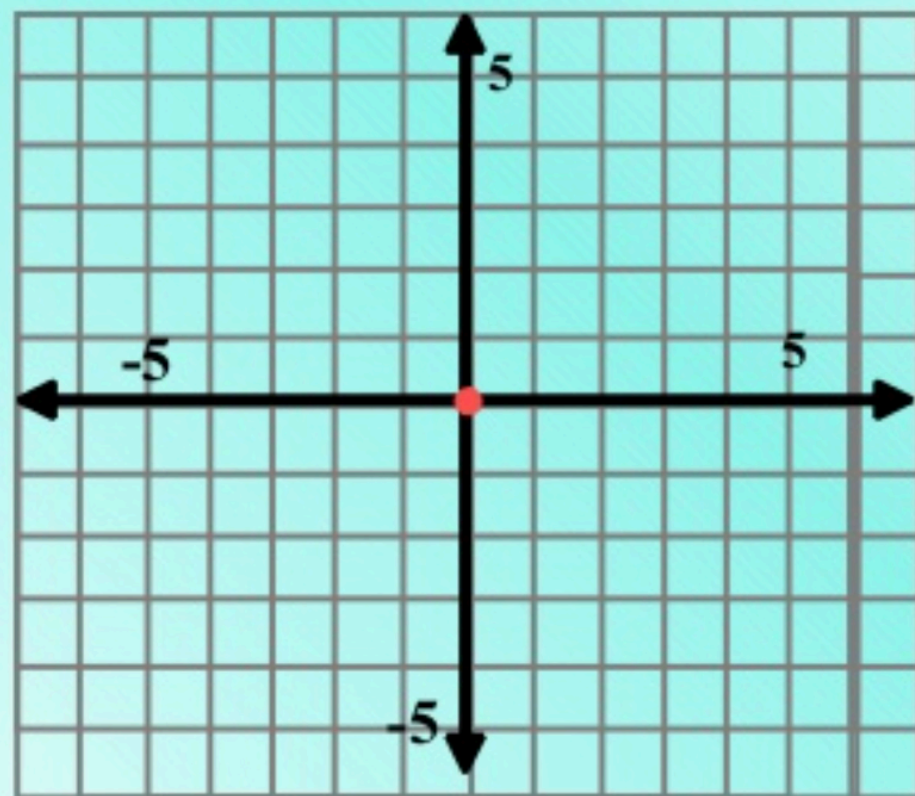
**X COMES BEFORE Y
IN THE ALPHABET!**

**x-axis (horizontal
axis)**

origin (0,0)

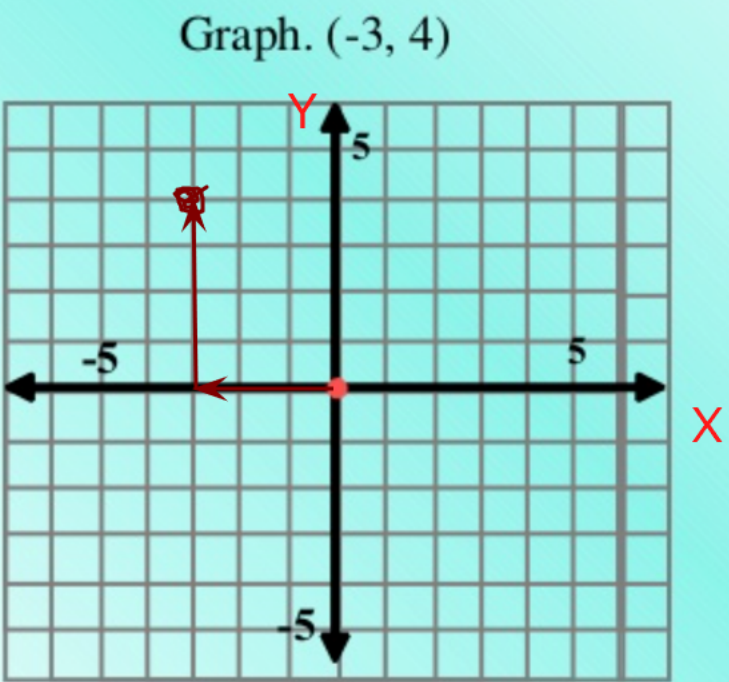
In an ordered pair, the first number is the **x-coordinate**. The second number is the **y-coordinate**. When graphing, always start at the **origin**. The x-coordinate tells you to move on the **x-axis**. A positive x goes right and a negative x goes left. The y-coordinate tells you to move on the **y-axis**. A positive y goes up and a negative y goes down.

Graph. $(-3, 4)$



- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

In an ordered pair, the first number is the **x-coordinate**. The second number is the **y-coordinate**. When graphing, always start at the **origin**. The x-coordinate tells you to move on the **x-axis**. A positive x goes right and a negative x goes left. The y-coordinate tells you to move on the **y-axis**. A positive y goes up and a negative y goes down.

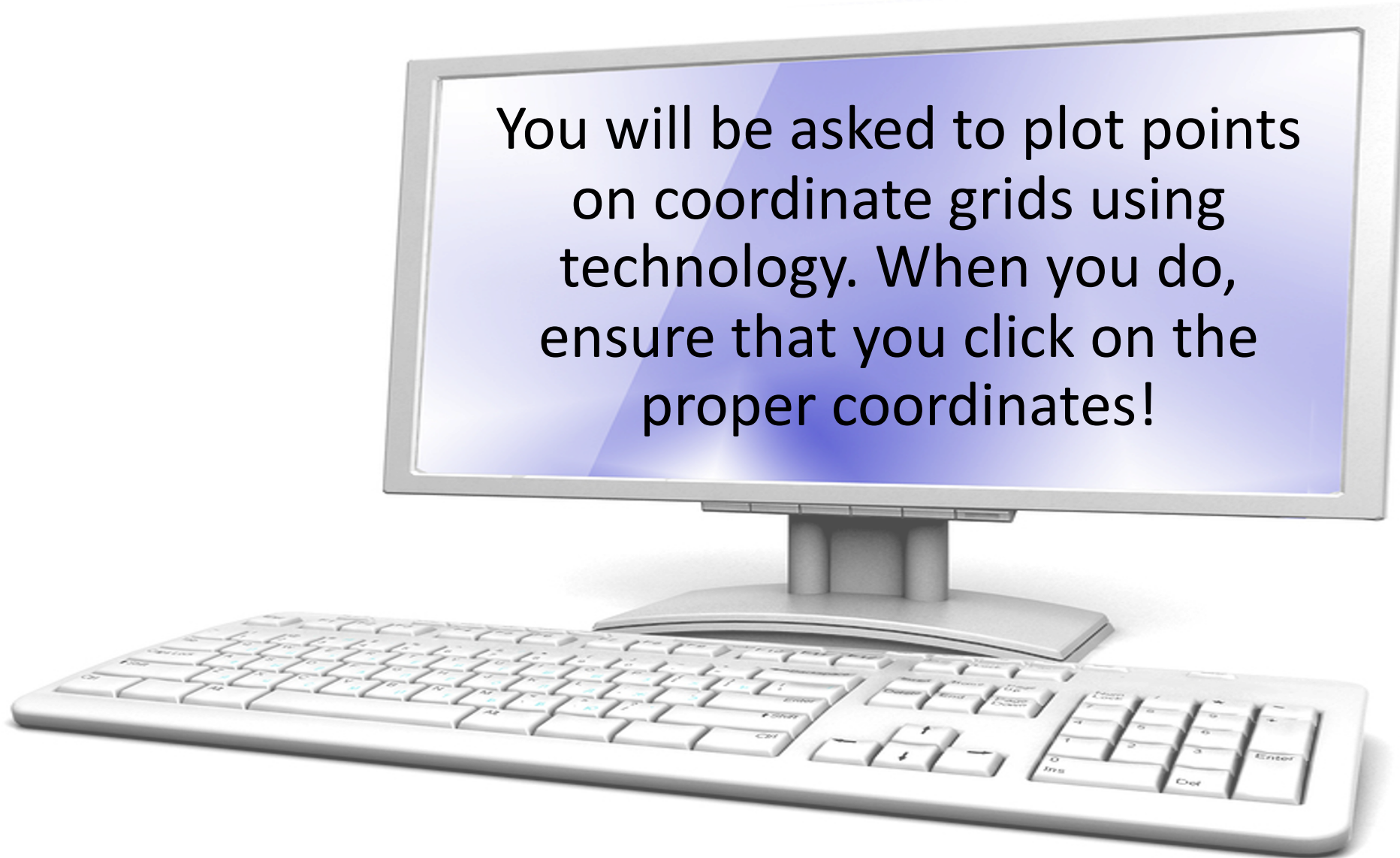


(x, y)
 move to the left 3
 (negative, x-coord
 move up 4 units
 (positive, y-coordi

Click to add notes

ON THE GED MATH TEST...

You will be asked to plot points on coordinate grids using technology. When you do, ensure that you click on the proper coordinates!

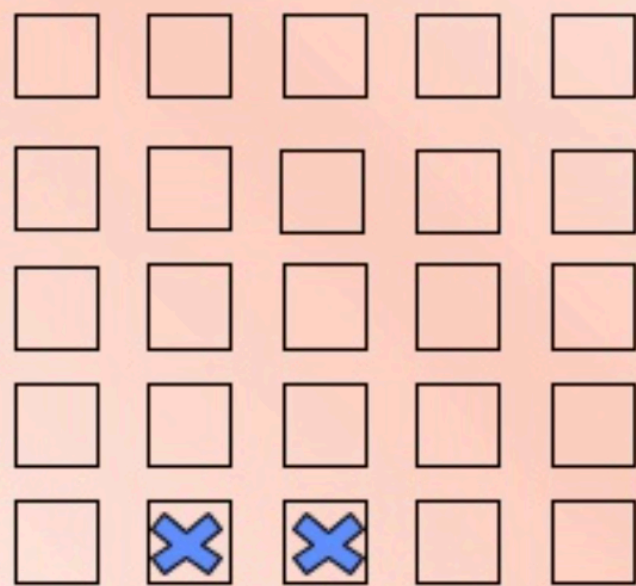


At the beginning of the year, I created a seating chart for my class. I created 5 rows of desks with 5 desks in each row.

Brian sits in the third row at the second desk (3,2).

Dewayne sits in the second row at the third desk (2,3).

Are these seats the same?



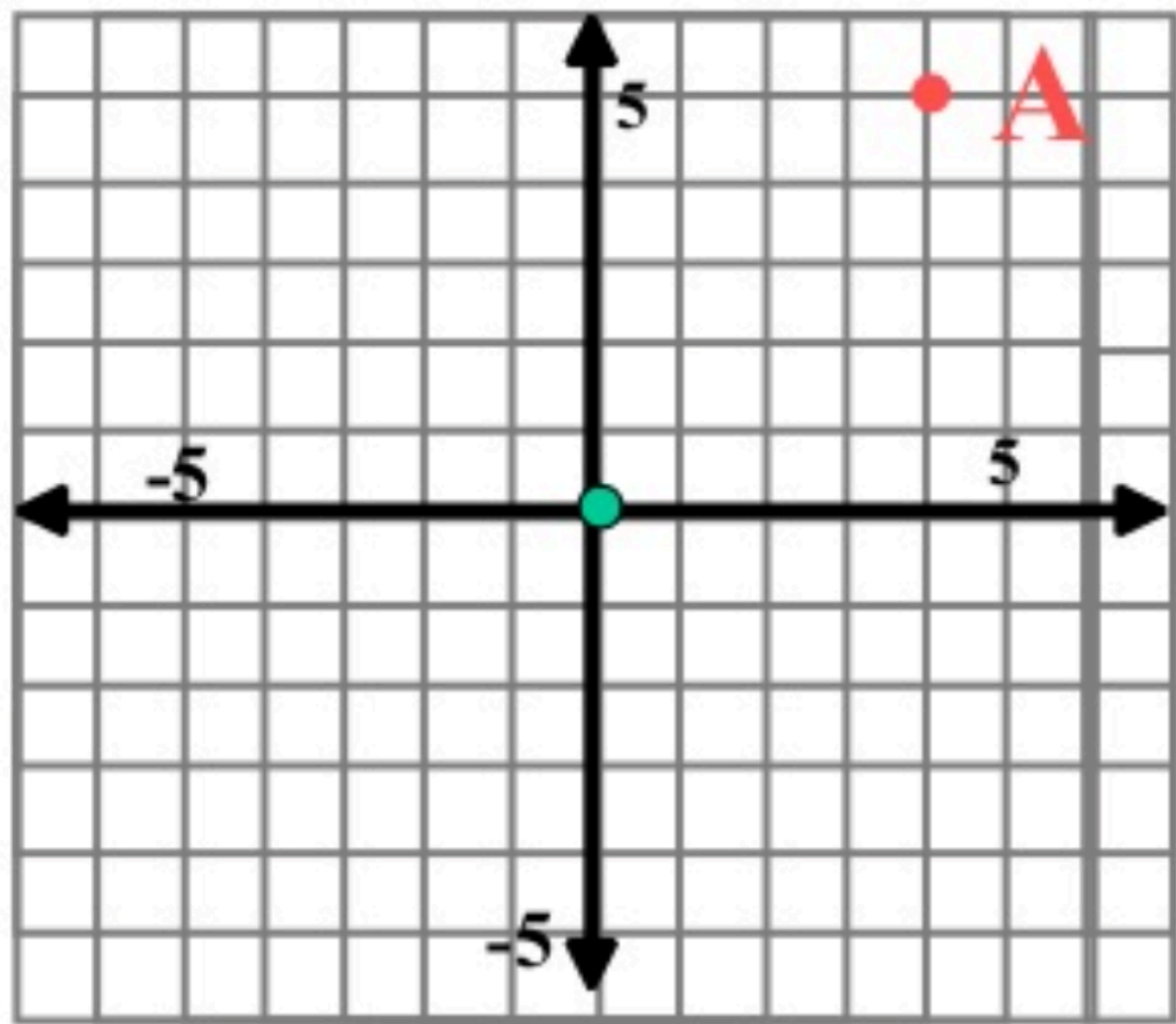
No!! The seats **(3,2)** and **(2,3)** are called **ordered pairs** because the order in which the pair of numbers is written is important!!

Who is sitting in desk (4,2)?

4	A	B	C	D	E
3	F	G	H	I	J
2	K	L	M	N	O
1	P	Q	R	S	T
	1	2	3	4	5

What is the ordered pair for A?

1. $(5, 4)$
2. $(4, 5)$
3. $(-5, 4)$
4. $(4, -5)$



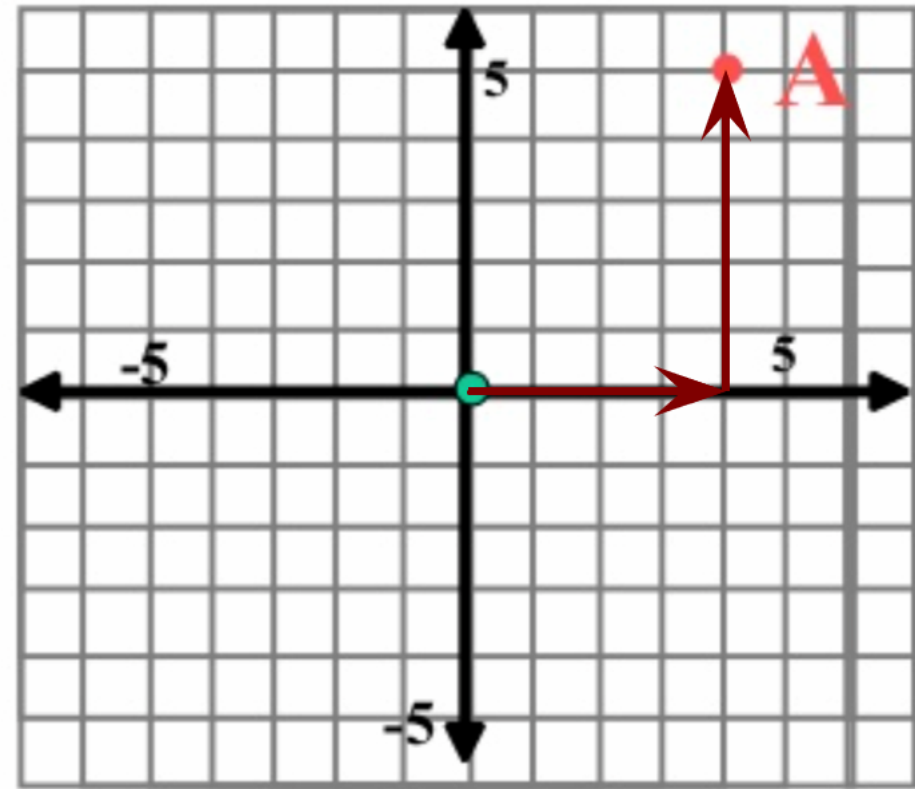
What is the ordered pair for A?

1. $(5, 4)$

2. $(4, 5)$

3. $(-5, 4)$

4. $(4, -5)$



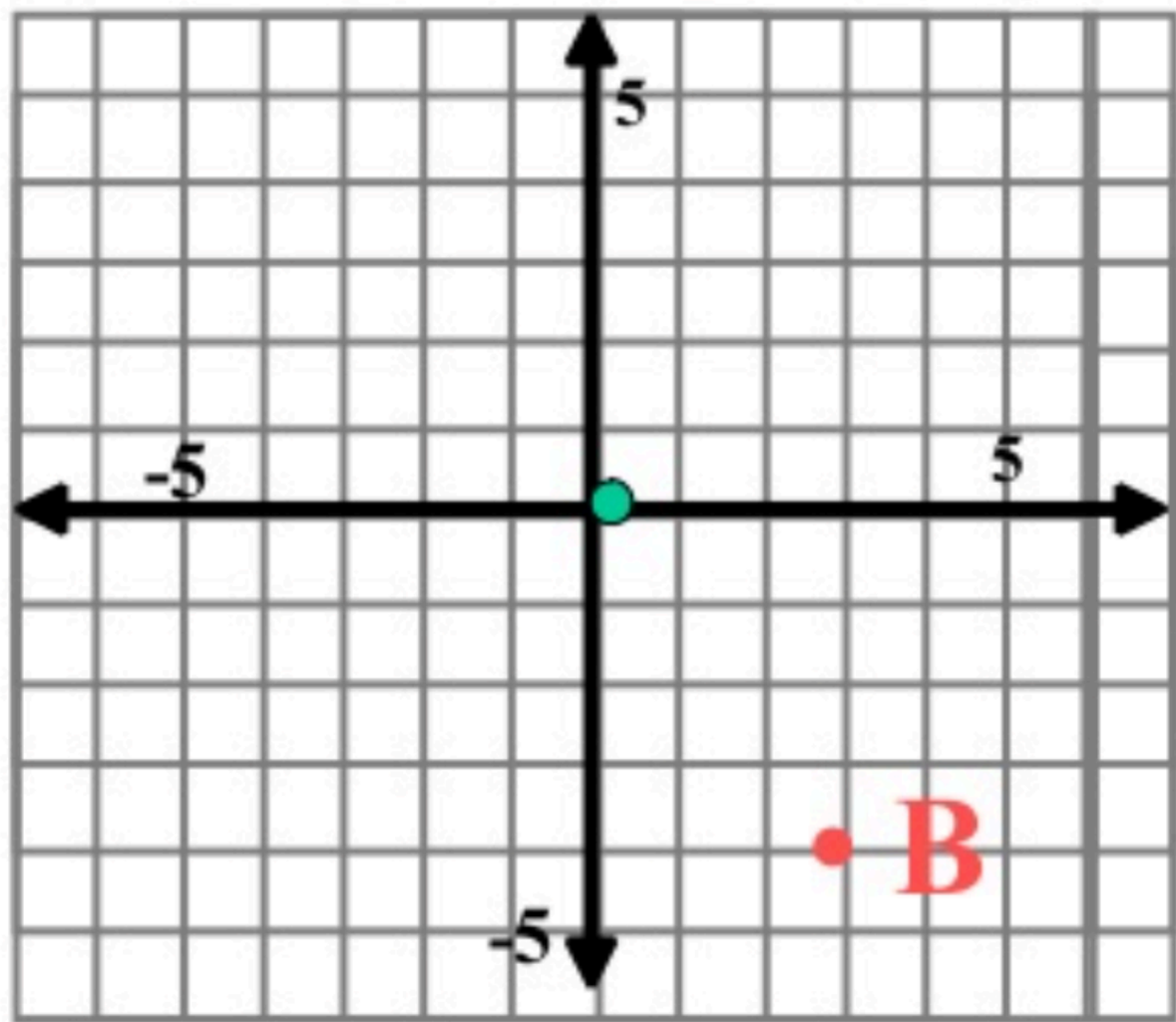
What is the ordered pair for B?

1. $(3, 4)$

2. $(-4, 3)$

3. $(-3, -2)$

4. $(3, -4)$



What is the ordered pair for B?

$(+3, -4)$

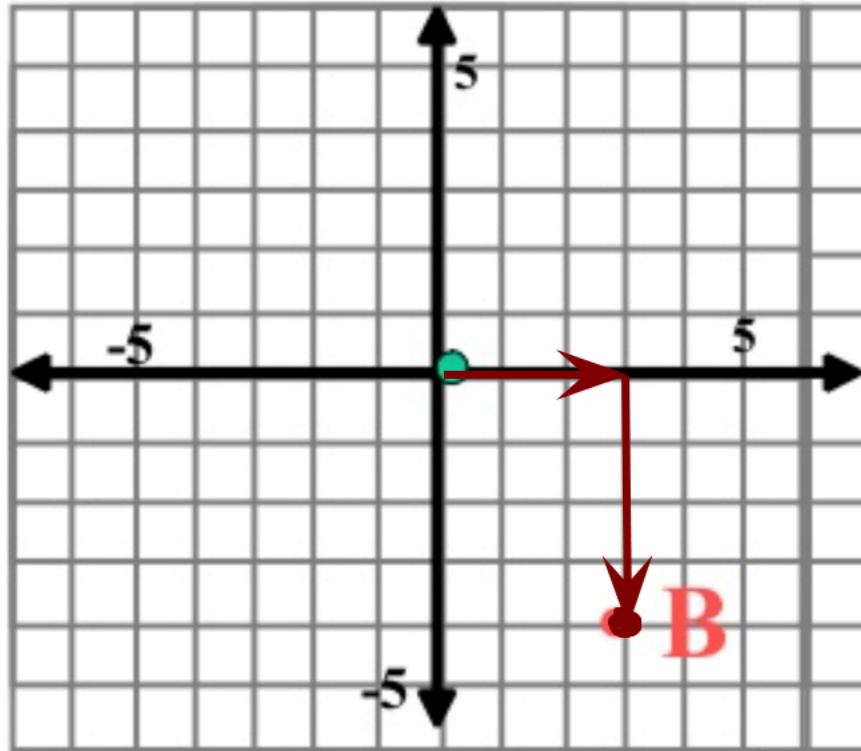
1. $(3, 4)$

2. $(-4, 3)$

3. $(-3, -2)$

4. $(3, -4)$

"right three units, down four units"



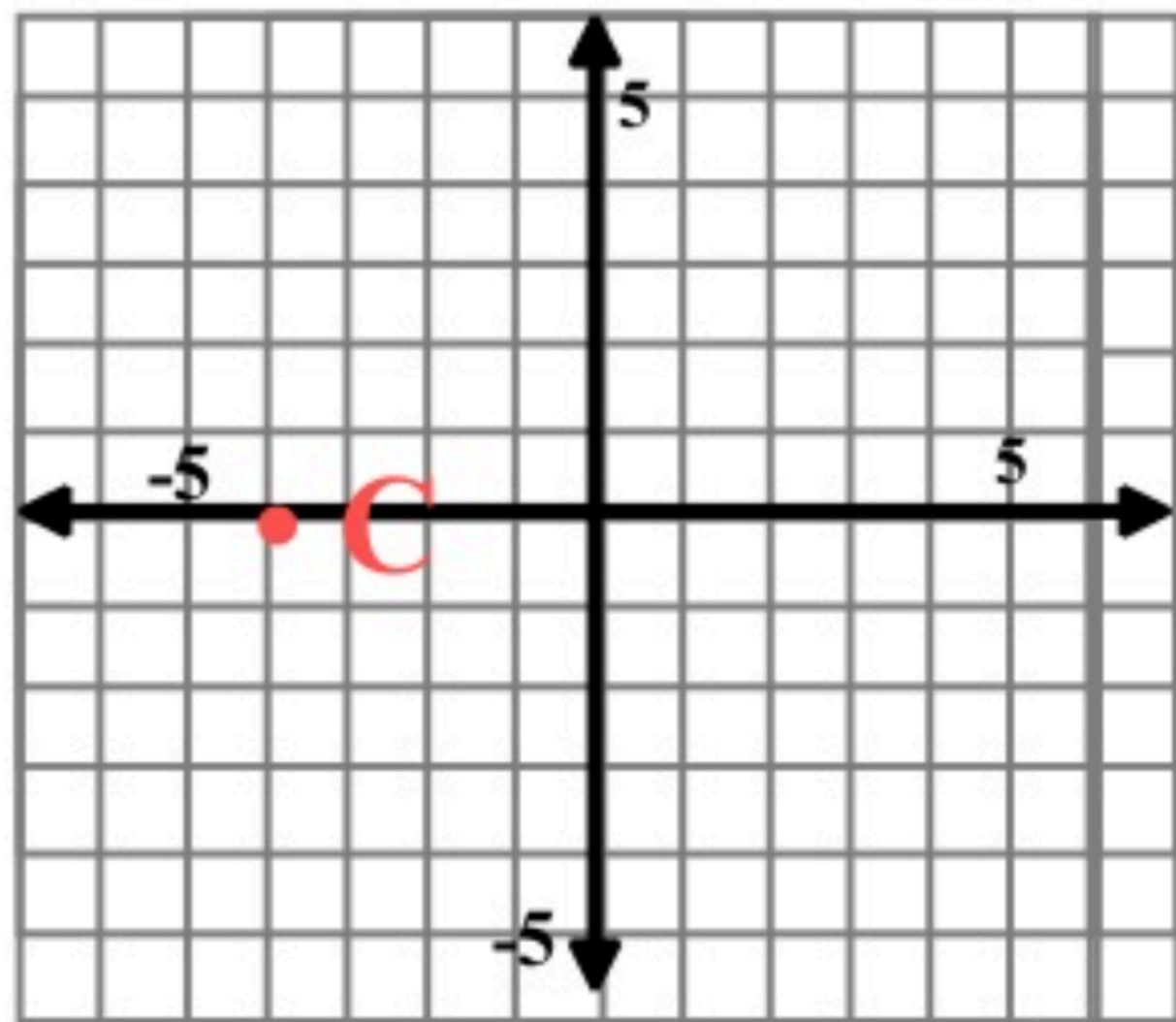
What is the ordered pair for C?

1. $(0, -4)$

2. $(-4, 0)$

3. $(0, 4)$

4. $(4, 0)$



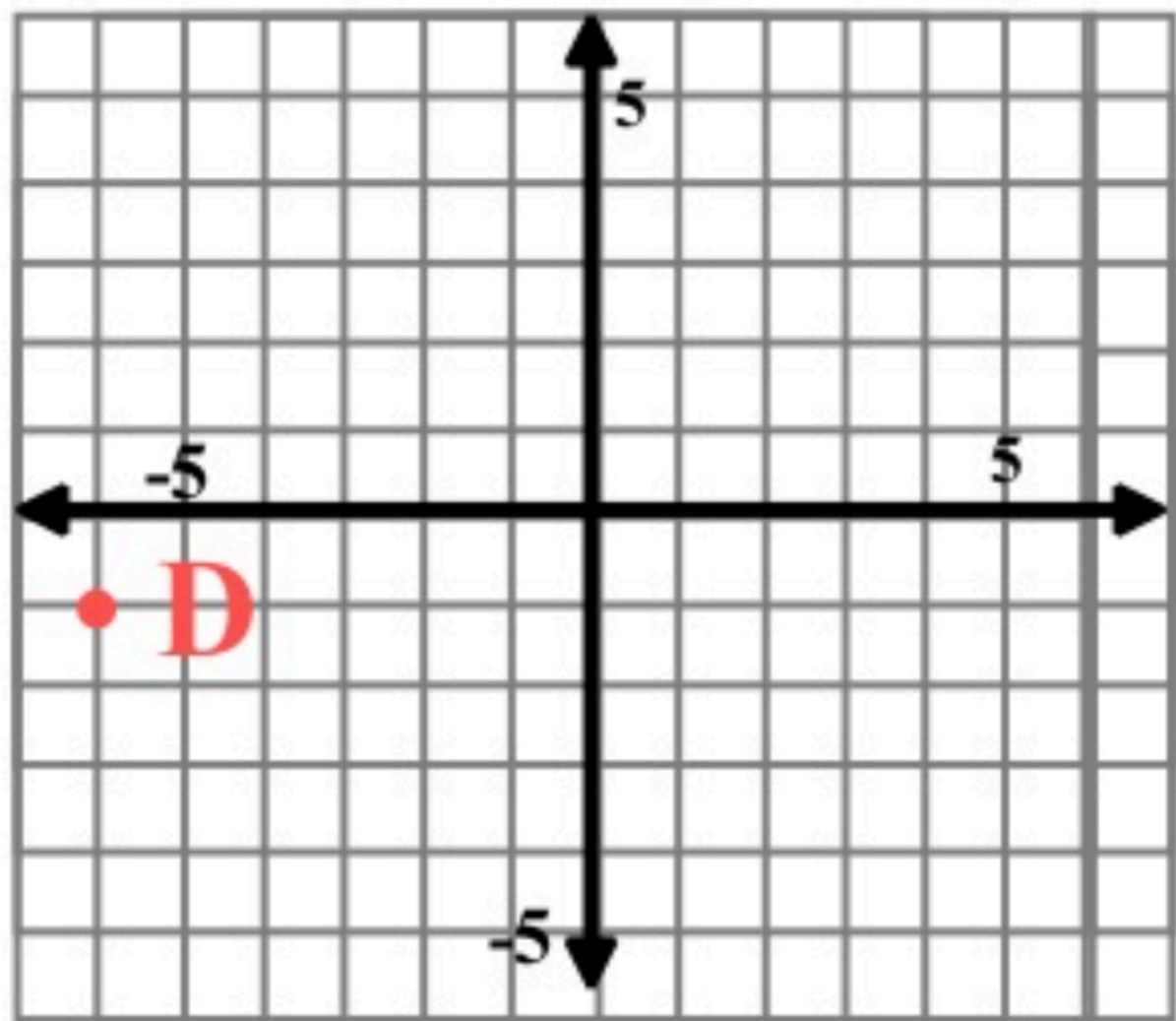
What is the ordered pair for D?

1. $(-1, -6)$

2. $(6, -1)$

3. $(-6, -1)$

4. $(-6, 1)$



What is the ordered pair for D?

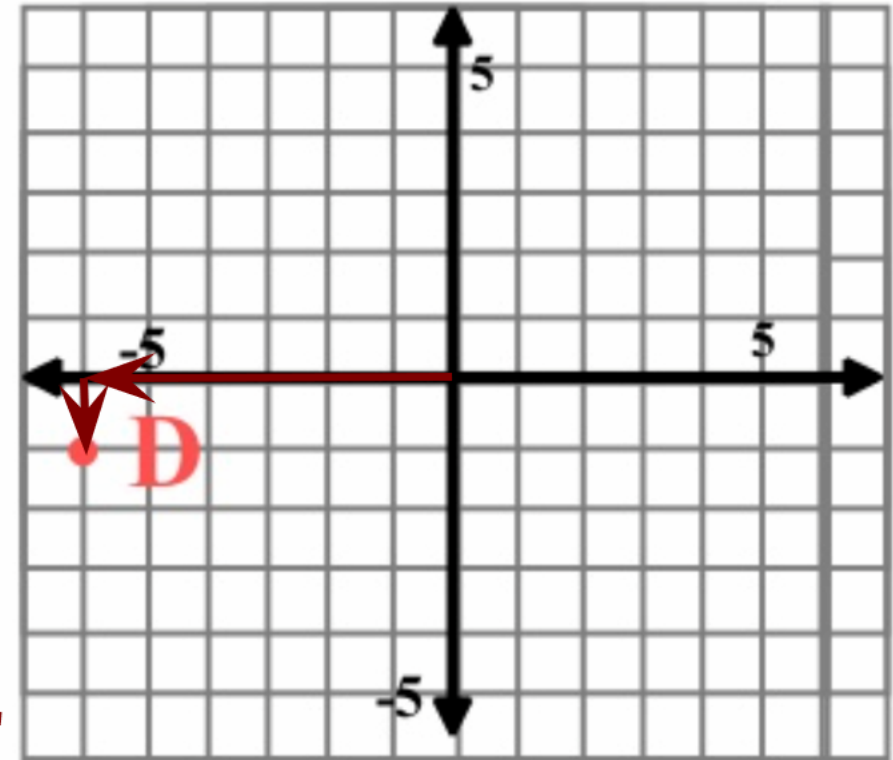
1. $(-1, -6)$

2. $(6, -1)$

3. $(-6, -1)$

4. $(-6, 1)$

"left six units, down one unit"



- 10 What is the ordered pair for A?
1. $(5, 4)$
2. $(4, 5)$
3. $(-5, 4)$
4. $(4, -5)$
- 11 What is the ordered pair for B?
1. $(3, 4)$
2. $(-4, 3)$
3. $(-3, -2)$
4. $(3, -4)$
- 12 What is the ordered pair for C?
1. $(0, -4)$
2. $(-4, 0)$
3. $(0, 4)$
4. $(4, 0)$
- 13 What is the ordered pair for D?
1. $(-1, -6)$
2. $(6, -1)$
3. $(-6, -1)$
4. $(-6, 1)$
- 14 Write the ordered pairs that name points A, B, C, and D.
- 15 Name the quadrant in which the point is located $(-5, 4)$
- 16 Name the quadrant in which each point is located $(-2, -7)$
- 17 Name the quadrant in which each point is located $(0, 3)$

Write the ordered pairs that name points A, B, C, and D.

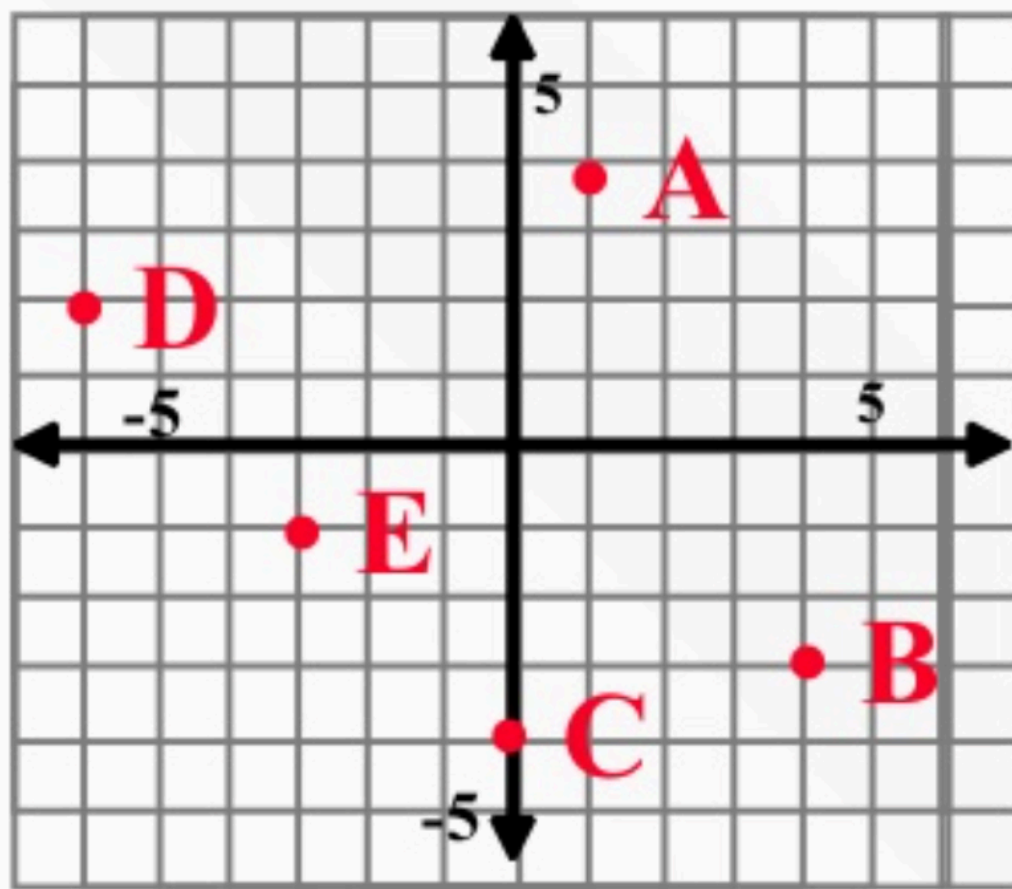
A =

B =

C =

D =

E =





12

What is the ordered pair for C?

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



13

What is the ordered pair for D?

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



14

Write the ordered pairs that name points A, B, C, and D.

- A =
B =
C =
D =
E =



15

Name the quadrant in which the point is located (-5, 4)

1. I
2. II
3. III
4. IV
5. None - x-axis
6. None - y-axis



16

Name the quadrant in which each point is located (-2, -7)

1. I
2. II
3. III
4. IV
5. None - x-axis
6. None - y-axis



17

Name the quadrant in which each point is located (0, 3)

1. I
2. II
3. III
4. IV
5. None - x-axis
6. None - y-axis



18

Graphing Linear Equations



19

Learn the Skill



Write the ordered pairs that name points A, B, C, and D. and E

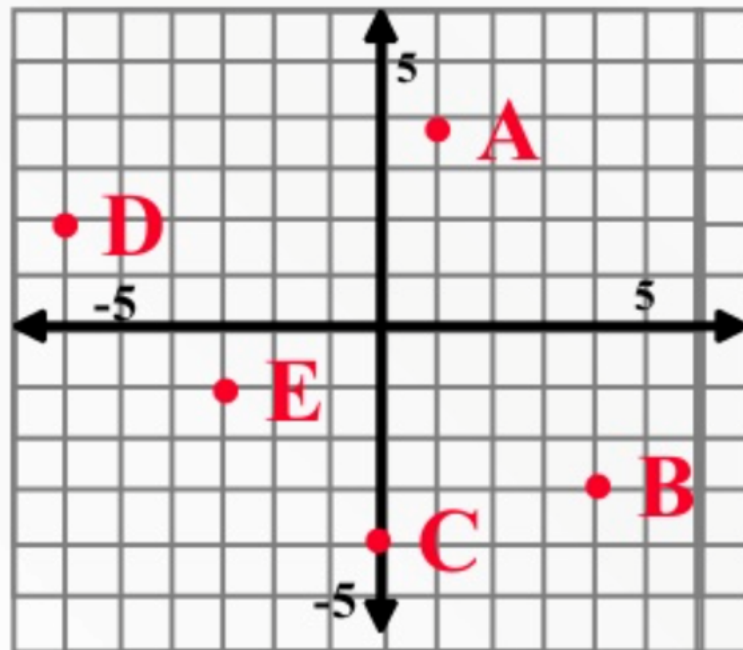
$$A = (1, 4)$$

$$B = (4, -3)$$

$$C = (0, -4)$$

$$D = (-6, 2)$$

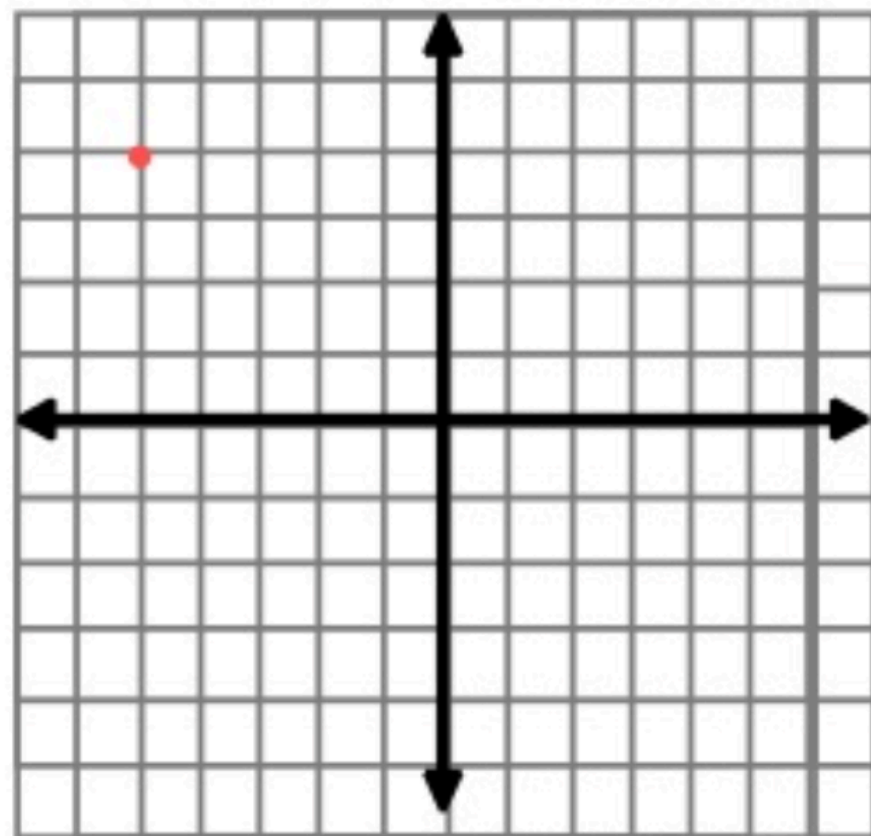
$$E = (-3, -1)$$



Click to add notes

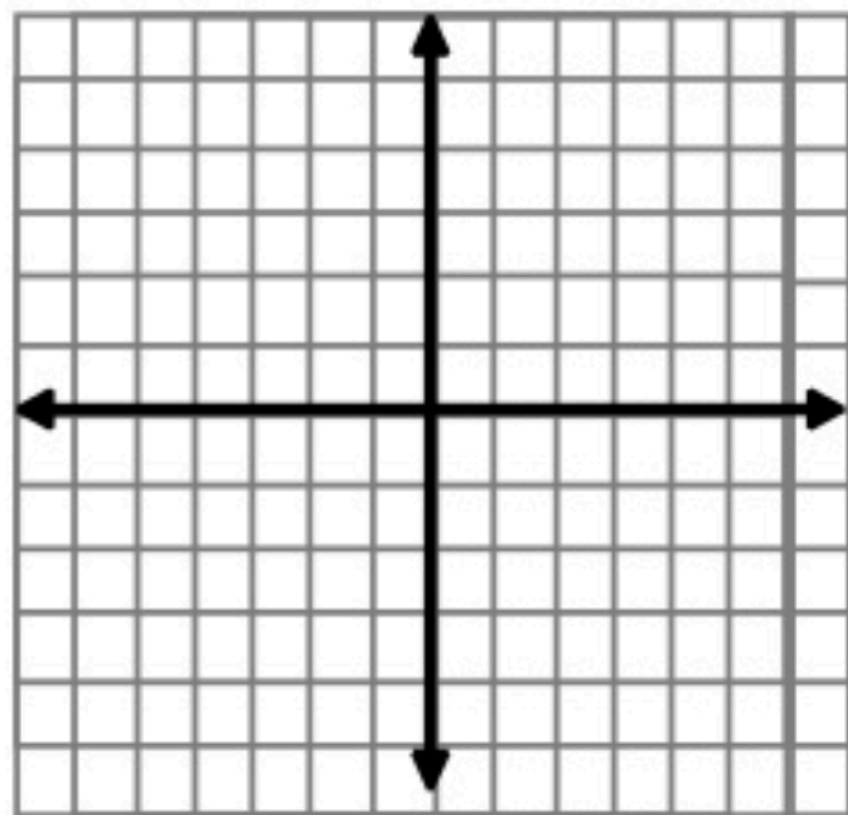
Name the quadrant in which the
point is located
 $(-5, 4)$

1. I
2. II
3. III
4. IV
5. None – x-axis
6. None – y-axis



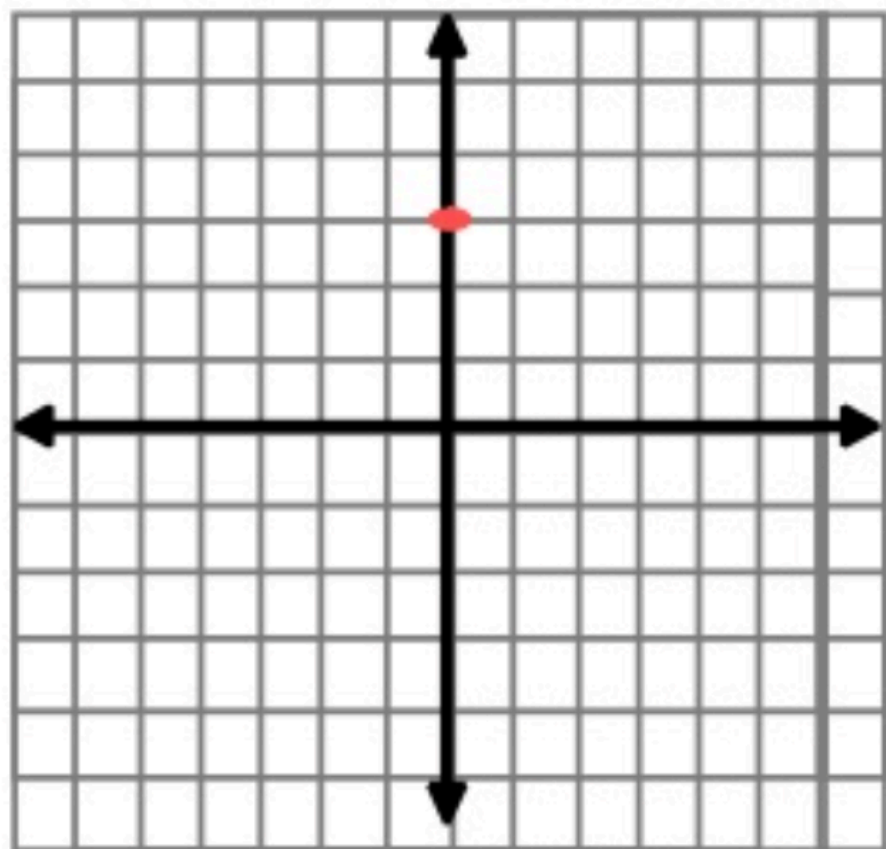
Name the quadrant in which each
point is located
 $(-2, -7)$

1. I
2. II
3. III
4. IV
5. None – x-axis
6. None – y-axis



Name the quadrant in which each
point is located
 $(0, 3)$

1. I
2. II
3. III
4. IV
5. None – x-axis
6. None – y-axis

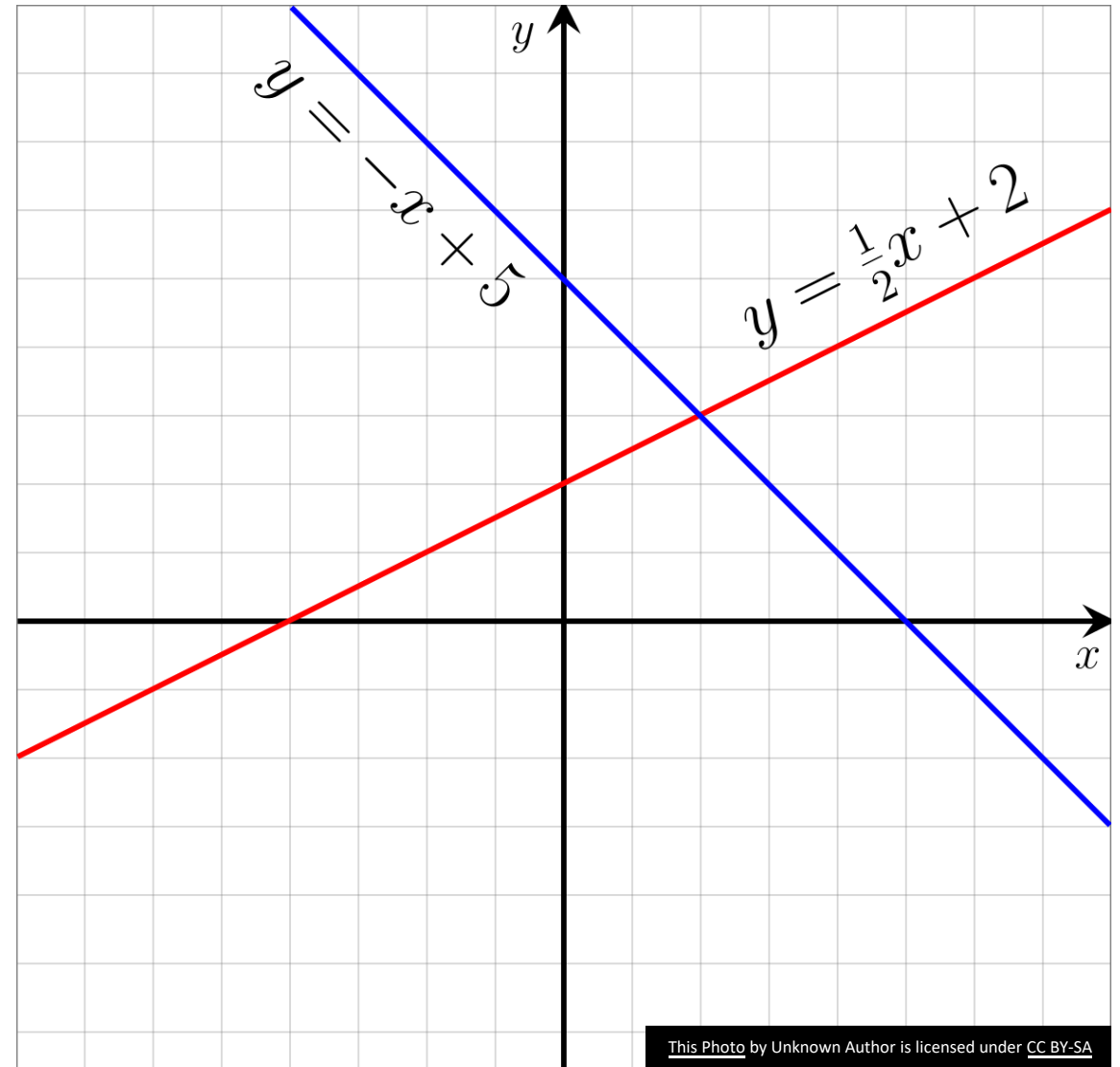


Graphing Linear Equations



Learn the Skill

- Some equations have two variables. In this case, the value of one variable depends on the other. You can show the possible solutions for an equation with two variables on a graph.
- A **linear equation** is one that forms a straight line when graphed. All of the solutions of the equation lie on a line. To draw a line, you must find at least two points on the line and connect them.



Example 1:

Graph the equation $x + 2y = 7$.

You can find two solutions, corresponding to the x -intercepts and y -intercepts of the graph, by setting first $x = 0$ and then $y = 0$.

When $x = 0$, we get:

$$0 + 2y = 7$$

$$y = 3.5$$

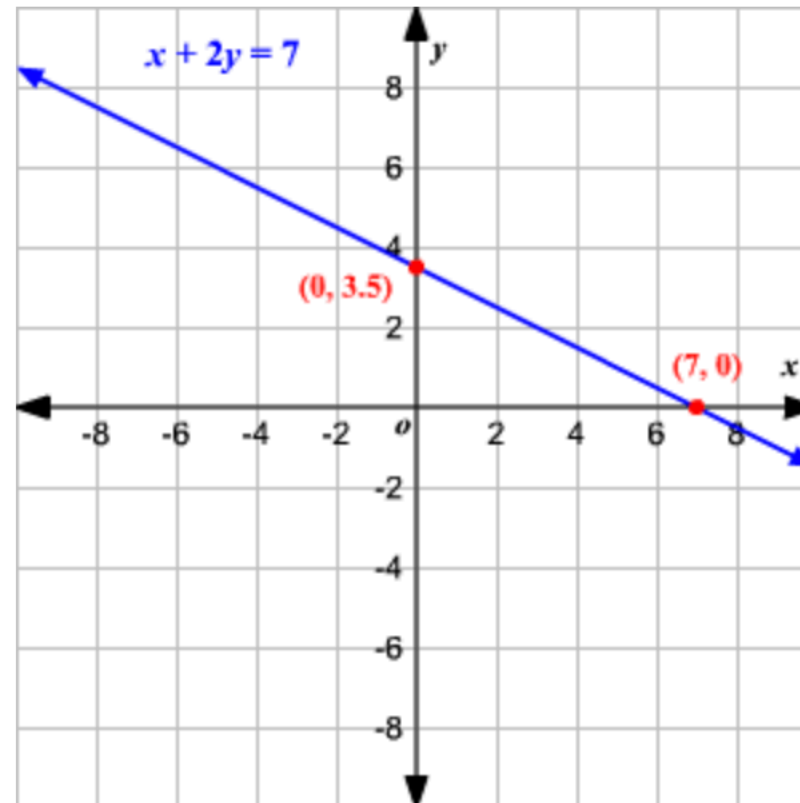
When $y = 0$, we get:

$$x + 2(0) = 7$$

$$x = 7$$

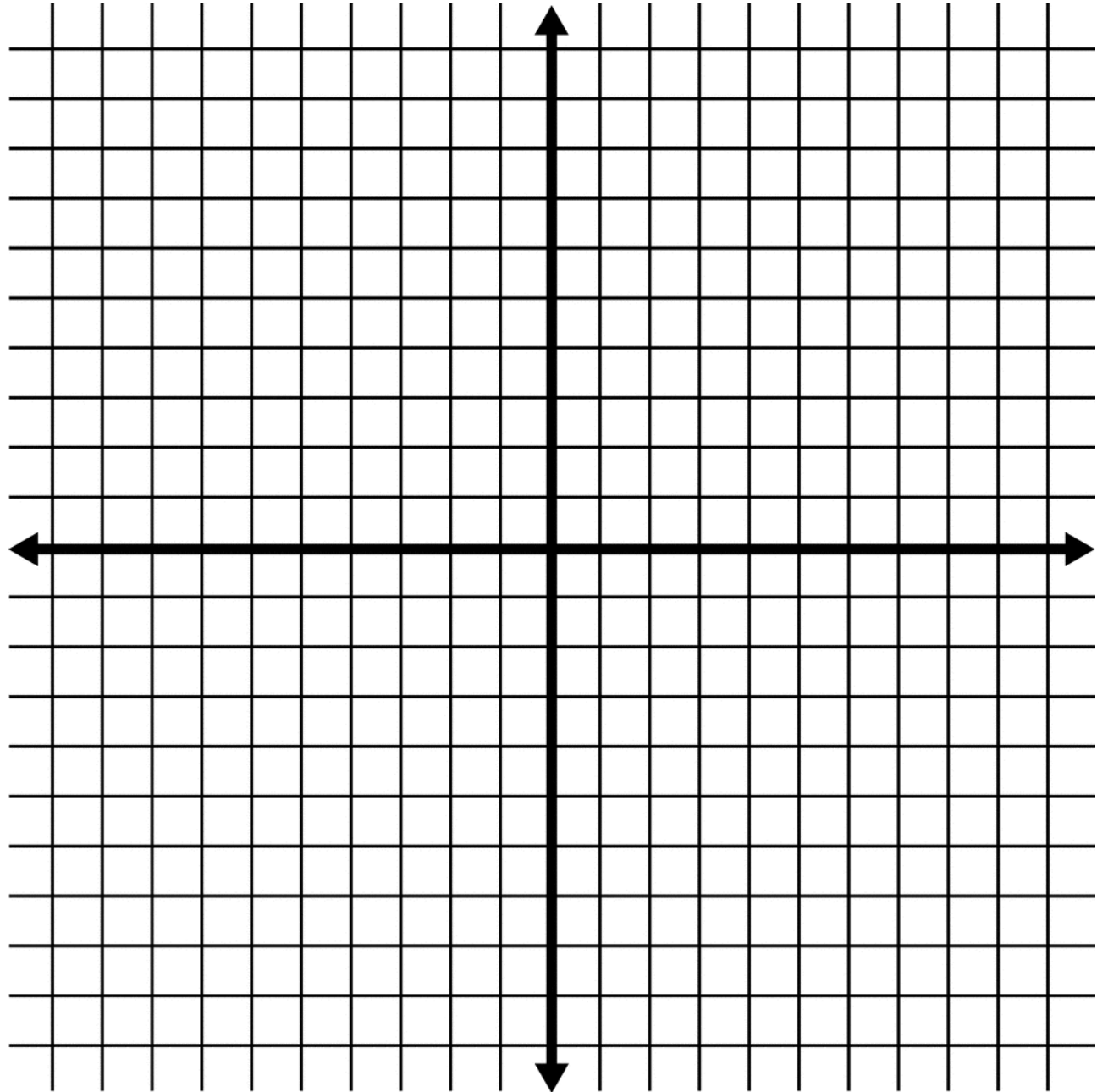
So the two points are $(0, 3.5)$ and $(7, 0)$.

Plot these two points and draw the line connecting them.



Draw the graph
of:

$$y = 2x + 2$$



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Eraser

Format

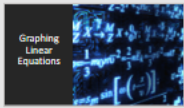
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18



19



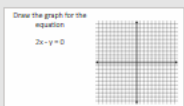
20



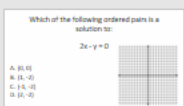
21



22



23



24



25



Draw the graph
of:

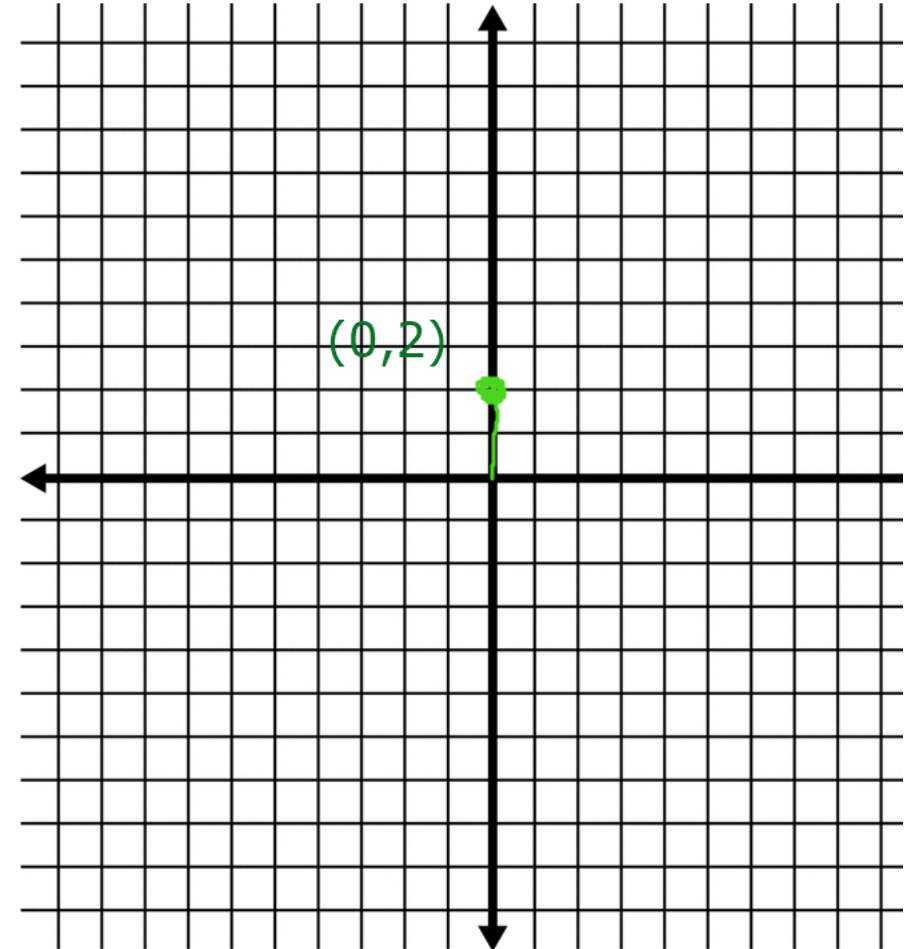
$$y = 2x + 2$$

When x is zero

$$y = 2(0) + 2 = 0 + 2 = 2$$

$(0, 2)$

When y is zero, x is ????



Click to add notes

File Home Insert Design Transitions

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Draw the graph
of: $0, ??$

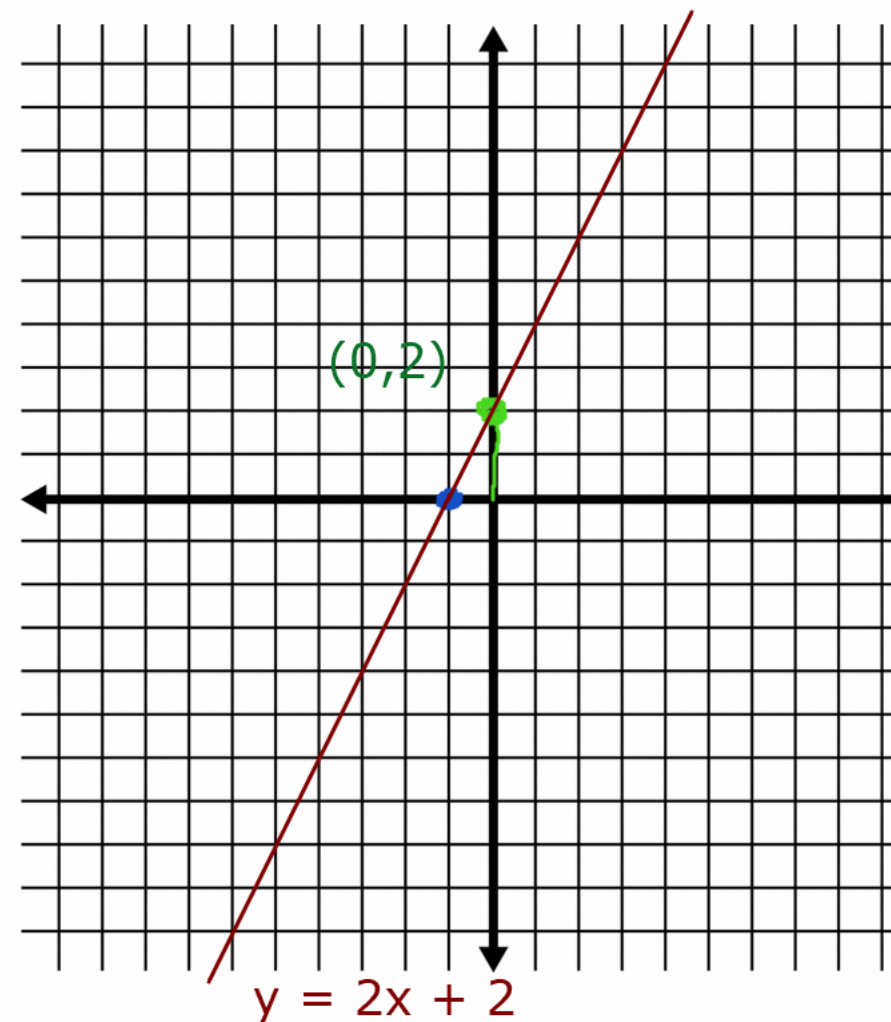
When y is zero, x is ????

$$y = 2x + 2$$

In this step, I
have an
equation with
only one
variable, and
I can solve
for x

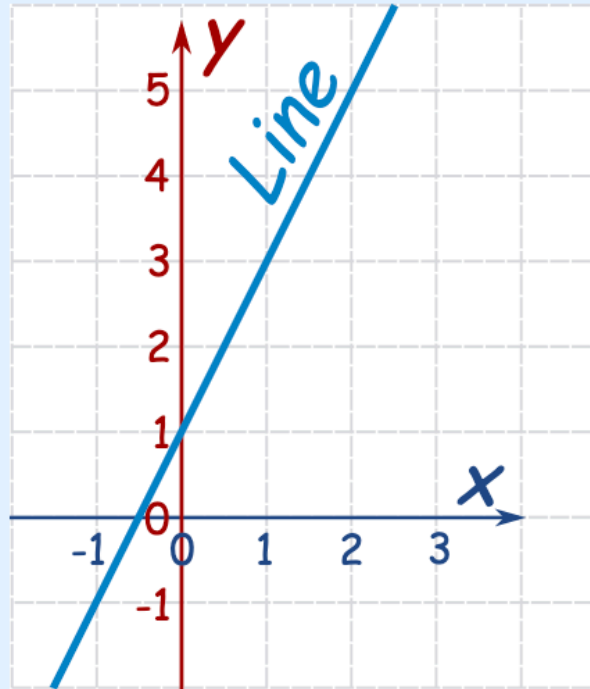
$$\begin{aligned} 0 &= 2x + 2 \\ -2 & \quad -2 \\ -2 &= 2x \\ /2 \quad /2 \\ -1 &= x \end{aligned}$$

write x -coordinate first: $(-1, 0)$



Click to add notes

Example: $y = 2x + 1$ is a linear equation:



The graph of $y = 2x + 1$ is a straight line

- When x increases, y increases **twice as fast**, so we need $2x$
- When x is 0, y is already 1. So $+1$ is also needed
- And so: $y = 2x + 1$

Consider the equation $y = 2x + 1$.

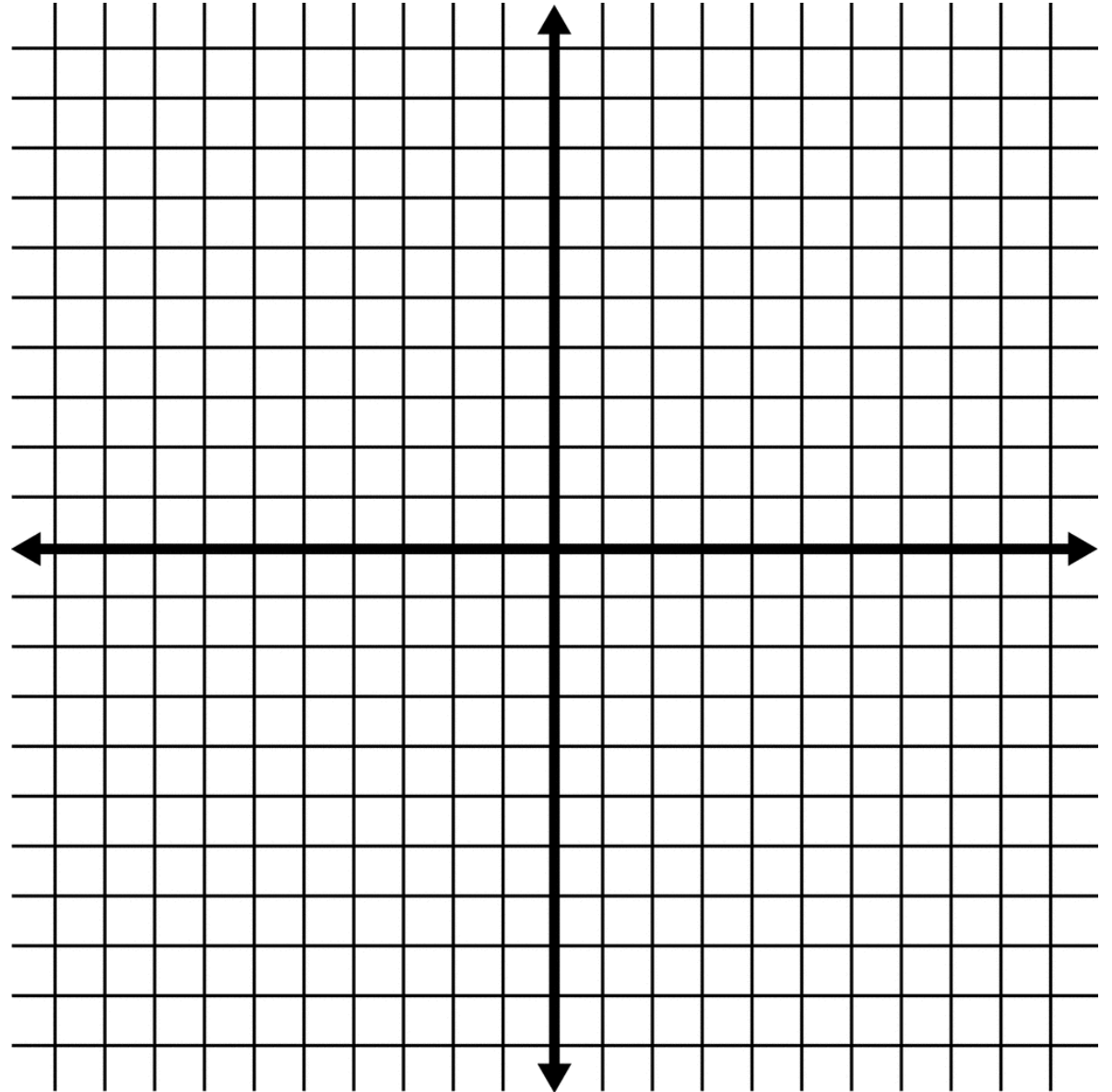
The *slope* of the equation is 2. When the x-value increases by one, the y-value increases by 2.

The *y-intercept* of the equation is 1. When x is zero, the value of the equation is one.

We can easily visualize most linear equations by writing them in the form $y = mx + b$, where (m) is the slope, and (b) is the y-intercept.

Draw the graph for
the equation

$$2x - y = 0$$



- 18 Graphing Linear Equations
- 19 Learn the Skill
- 20
- 21 Draw the graph of $y = 2x + 2$
- 22
- 23 Consider the equation $y = 2x + 2$
- 24 Draw the graph for the equation $2x - y = 0$
- 25 Which of the following ordered pairs is a solution for $2x - y = 0$

Draw the graph for the equation

$$y = mx + b$$

$$2x - y = 0$$

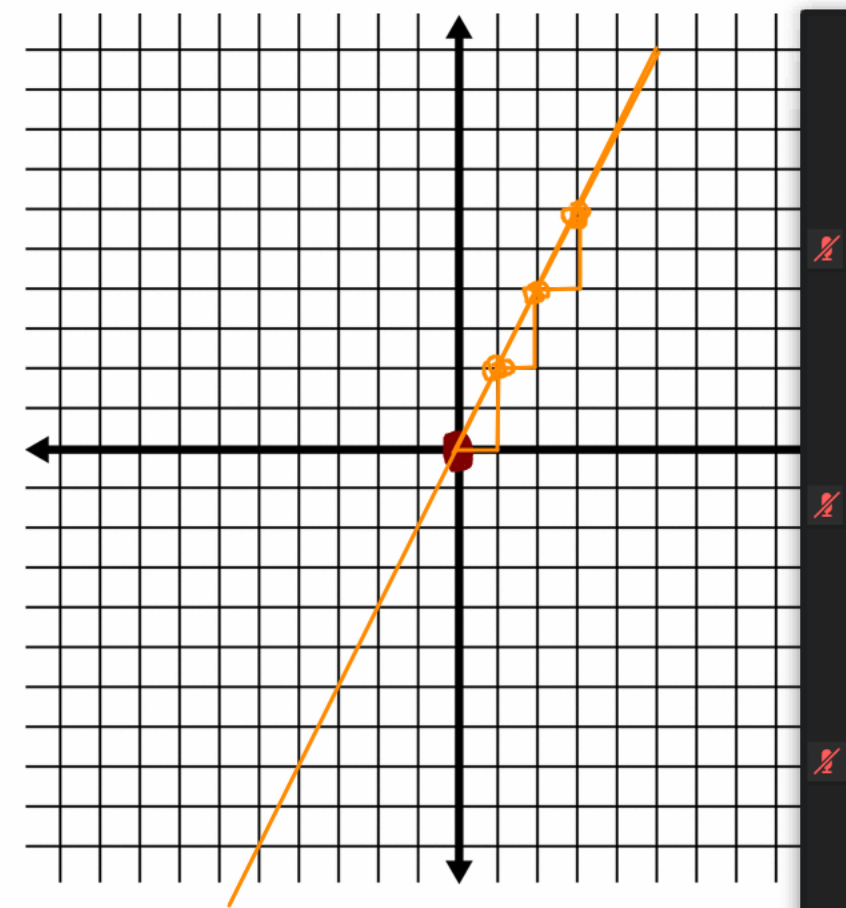
$$+y \quad +y$$

$$2x = y$$

$$y = 2x$$

this really means $y = 2x + 0$

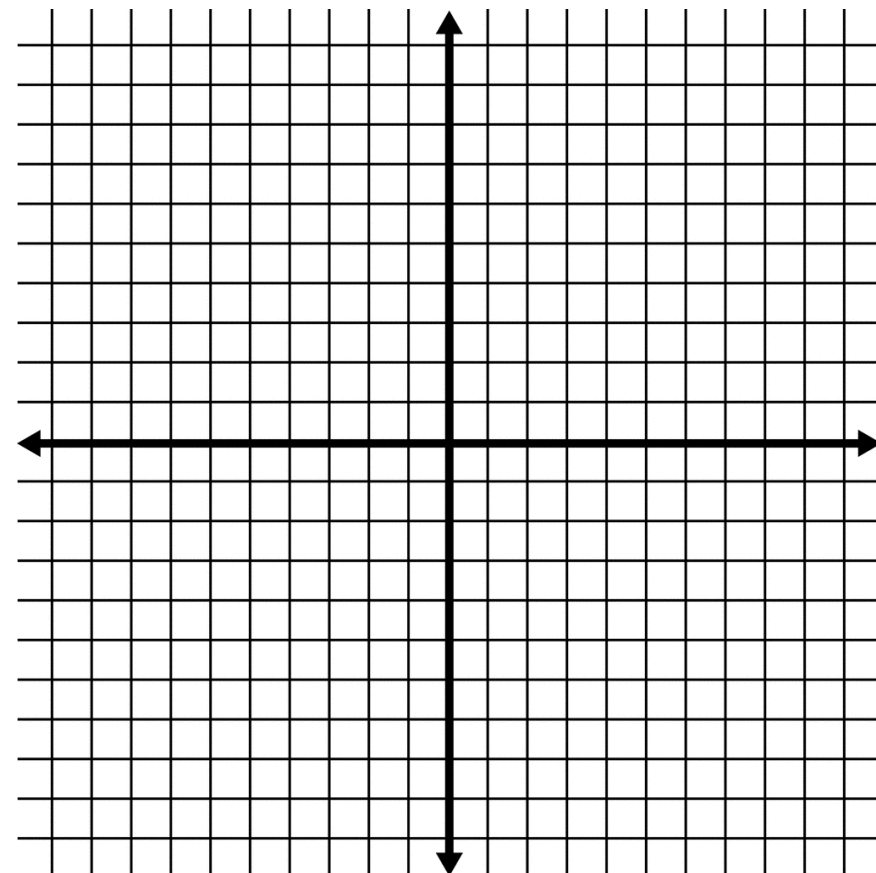
right one unit, up two units
(because I have +2 multiplied by x)



Which of the following ordered pairs is a solution to:

$$2x - y = 0$$

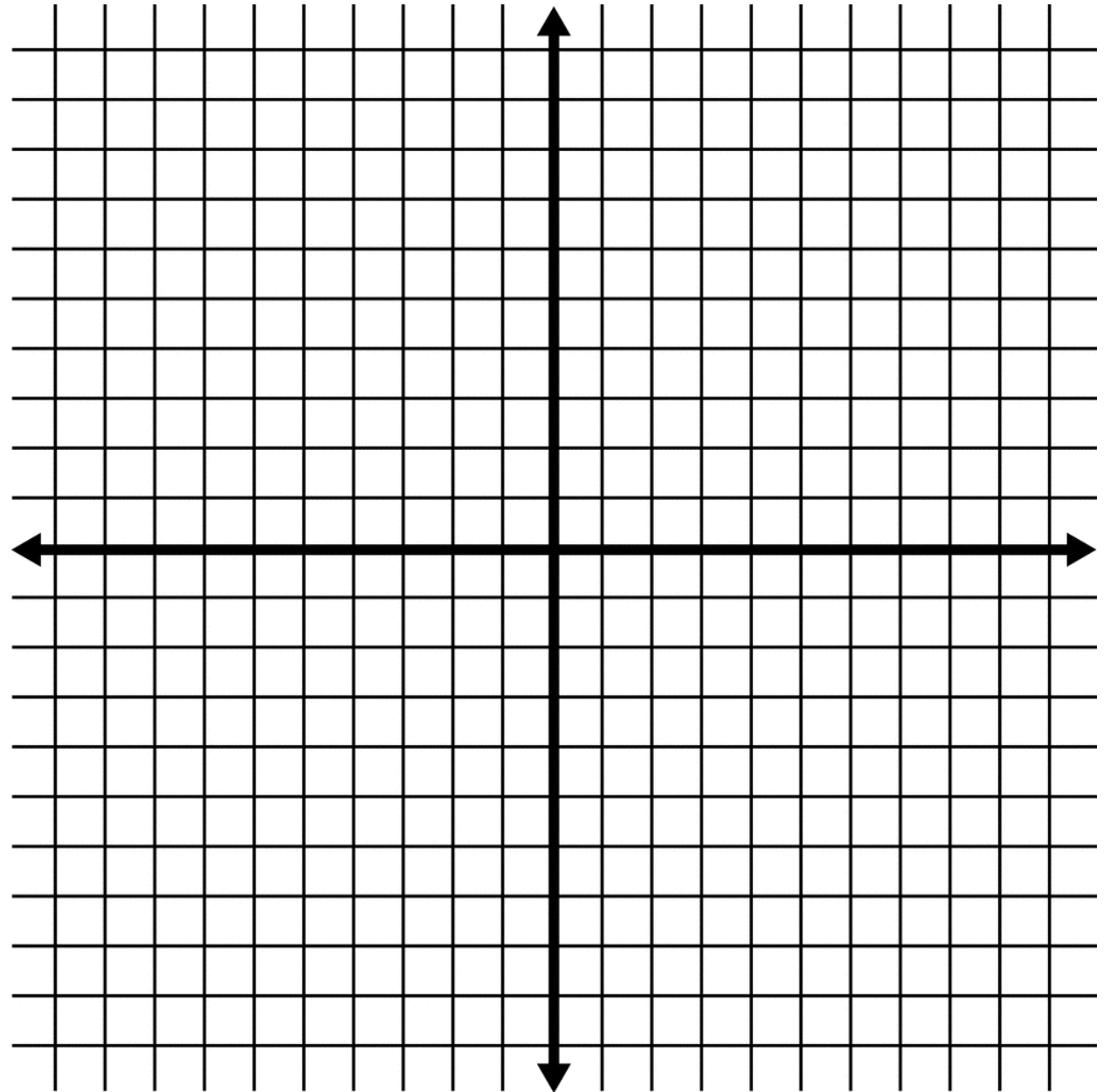
- A. (0, 0)
- B. (1, -2)
- C. (-1, -2)
- D. (2, -2)

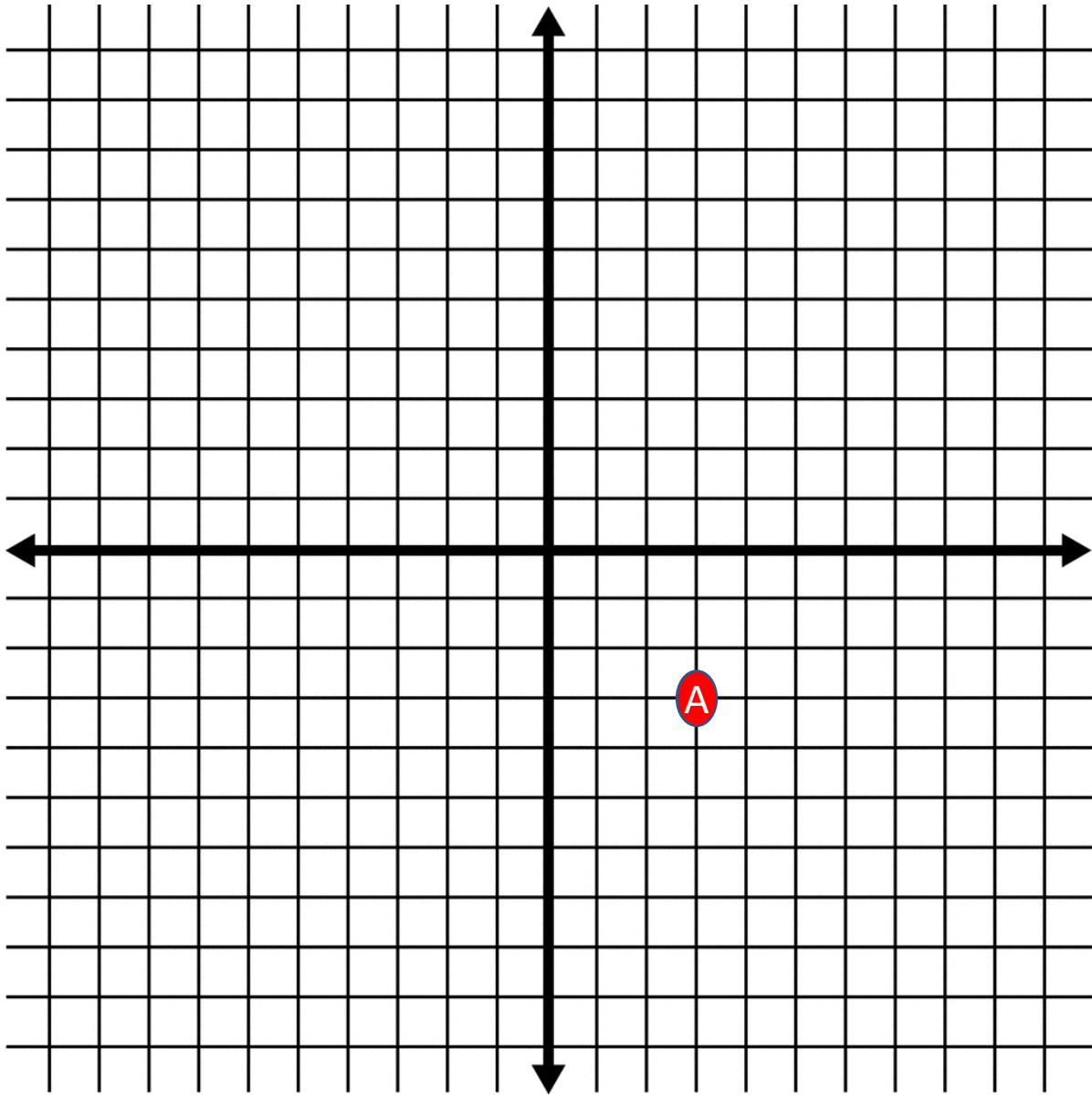


Which of the following ordered pairs is a point on the line of the equation:

$$x + 2y = 4$$

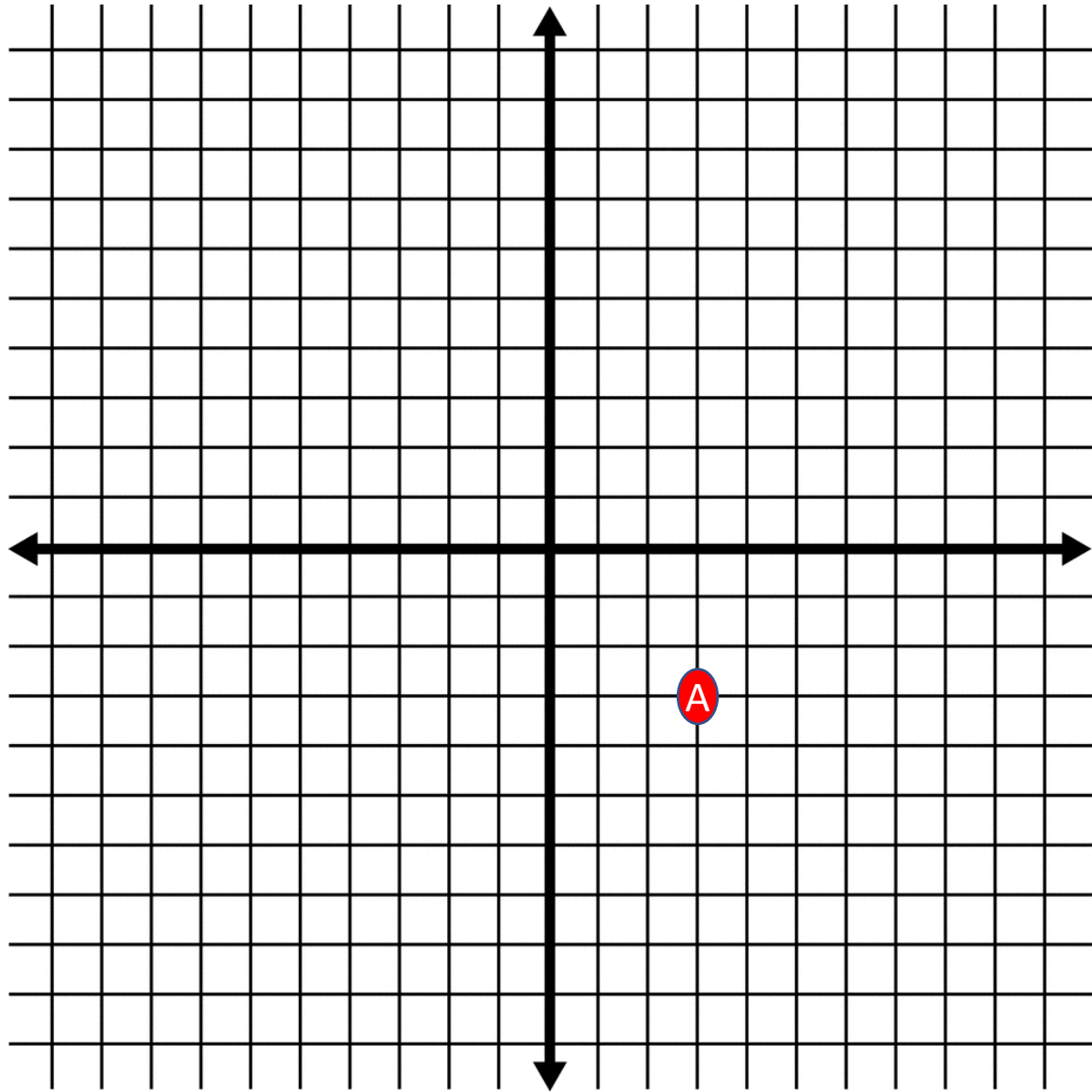
- A. $(-2, 0)$
- B. $(1, 3)$
- C. $(0, 2)$
- D. $(2, -4)$





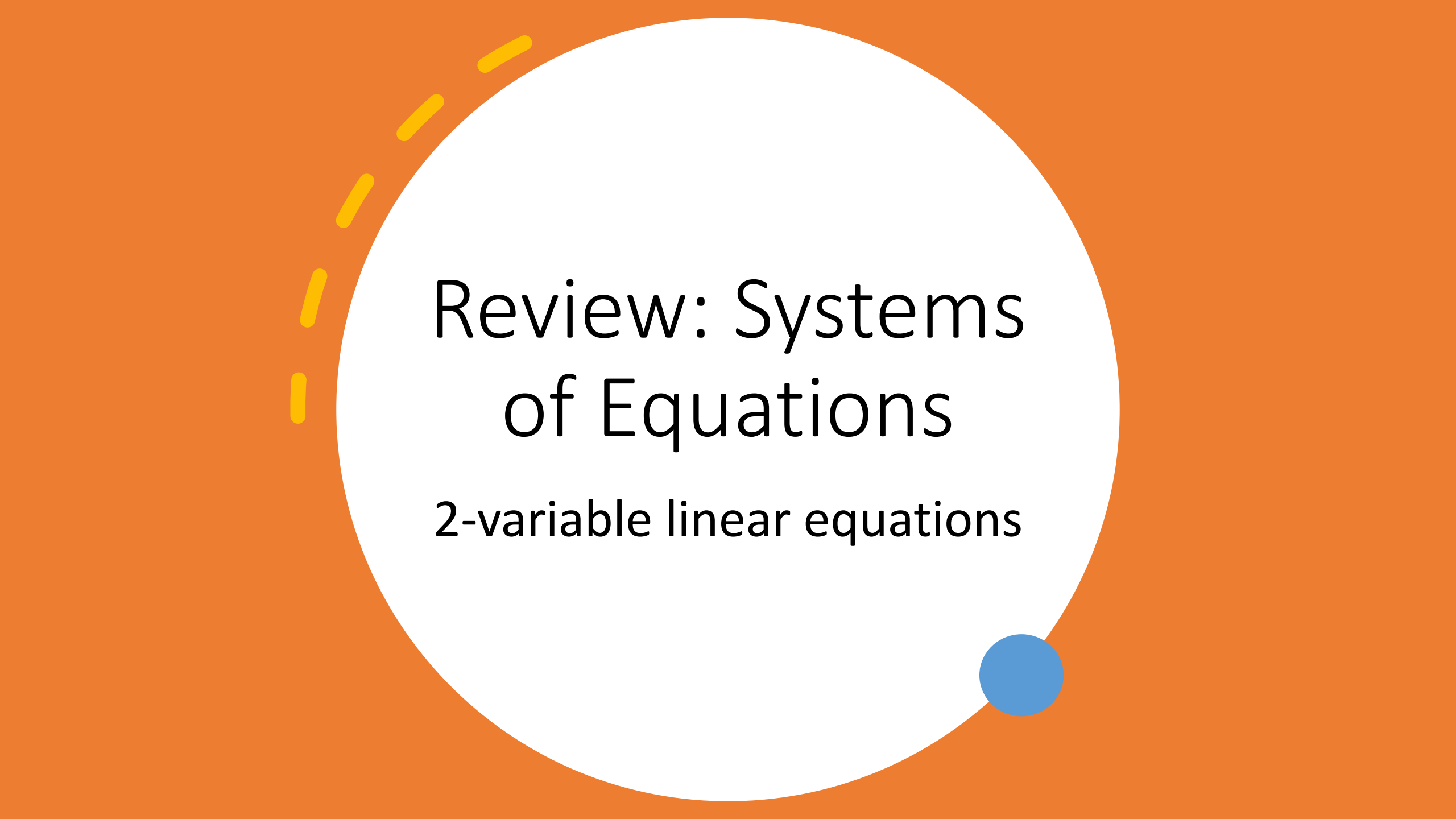
Point A lies on a line of the equation $x + 2x = -3y$. Which of the following are other points on this line?

- A. (0, -3)
- B. (-1, 2)
- C. (0, -2)
- D. (-5, 1)



Marvin walks a straight line from $(-5, 2)$ to $(-3, 1)$ and stops. Then he walks a straight line from $(-3, 1)$ to $(-1, -4)$. What is the approximate distance Marvin traveled?

- A. 14.94
- B. 9.04
- C. 7.62
- D. 5.83



Review: Systems of Equations

2-variable linear equations

Solve the system of linear equations:

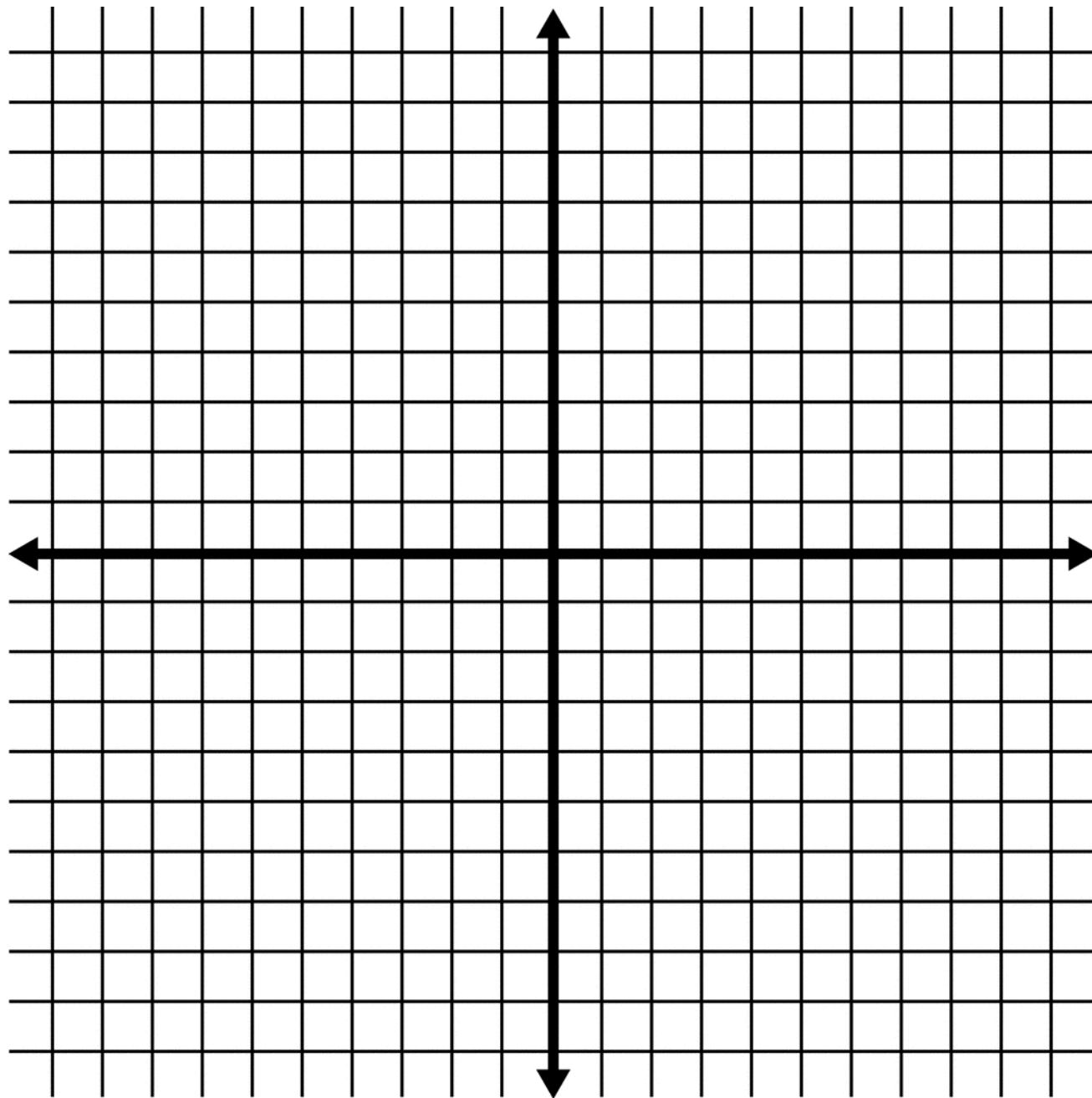
$$\begin{cases} x + y = 10 \\ 2x - y = 8 \end{cases}$$

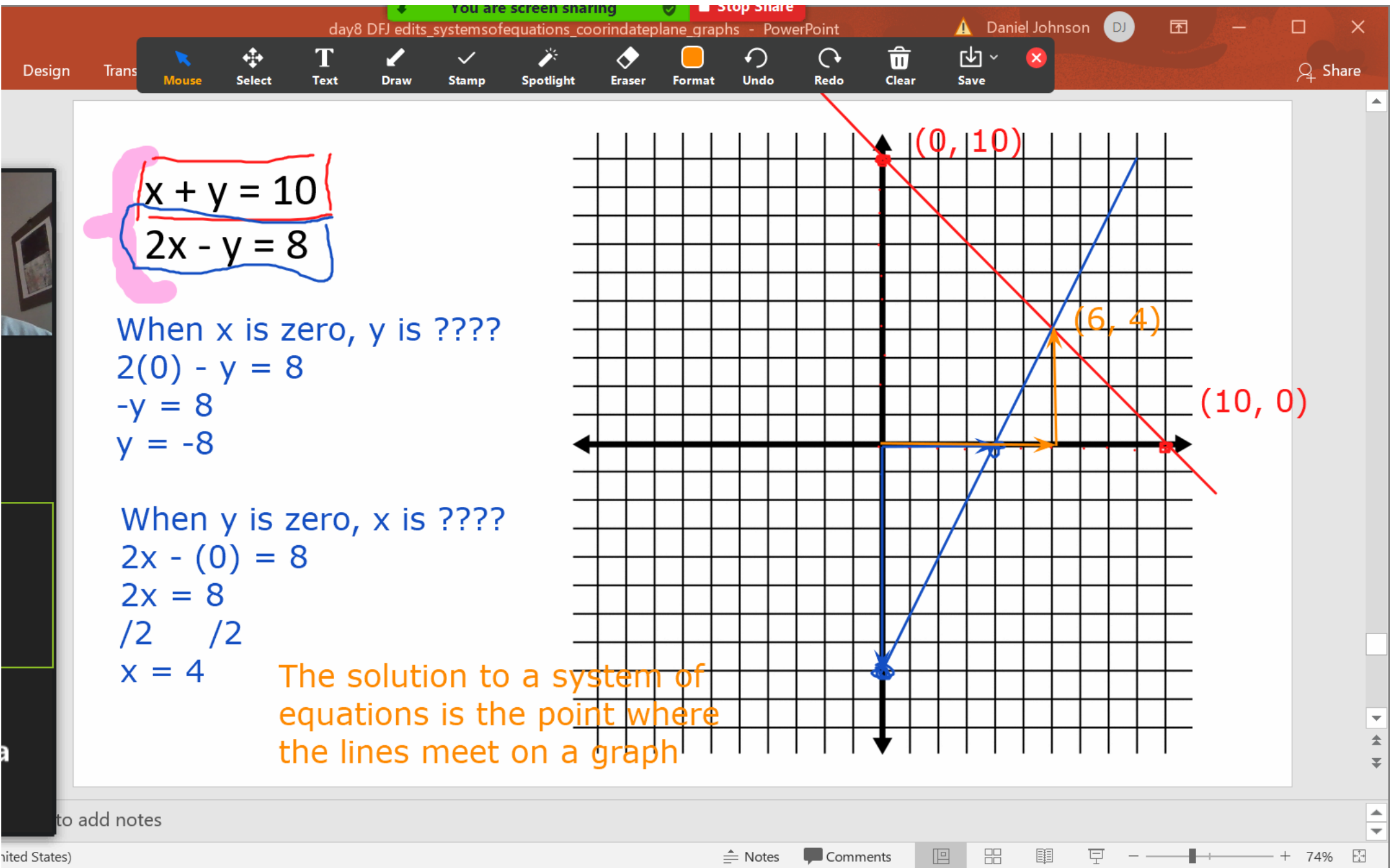
x =

y =

$$x + y = 10$$

$$2x - y = 8$$





$x + y = 10$

$2x - y = 8$

$6 + 4 = 10$

yes, this is true

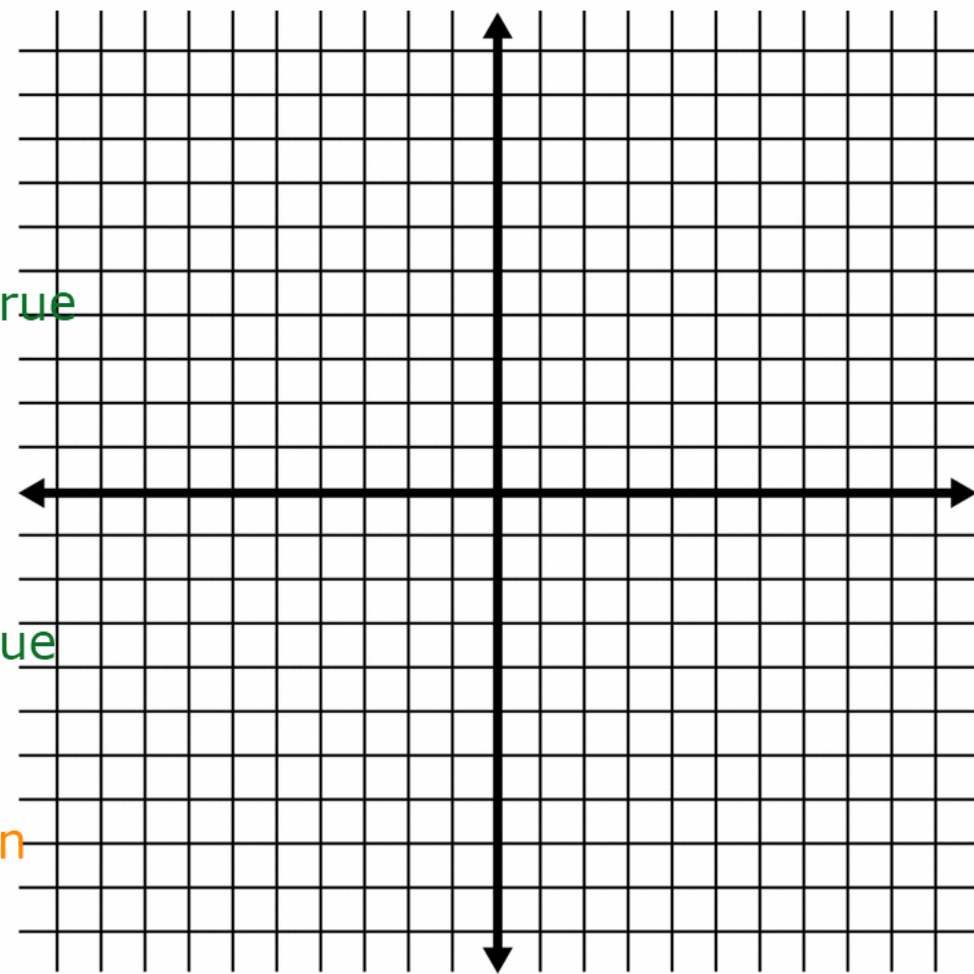
$2(6) - 4 = 8$

$12 - 4 = 8$

yes, this is true

The point (6, 4) is a solution to both equations

(6, 4)

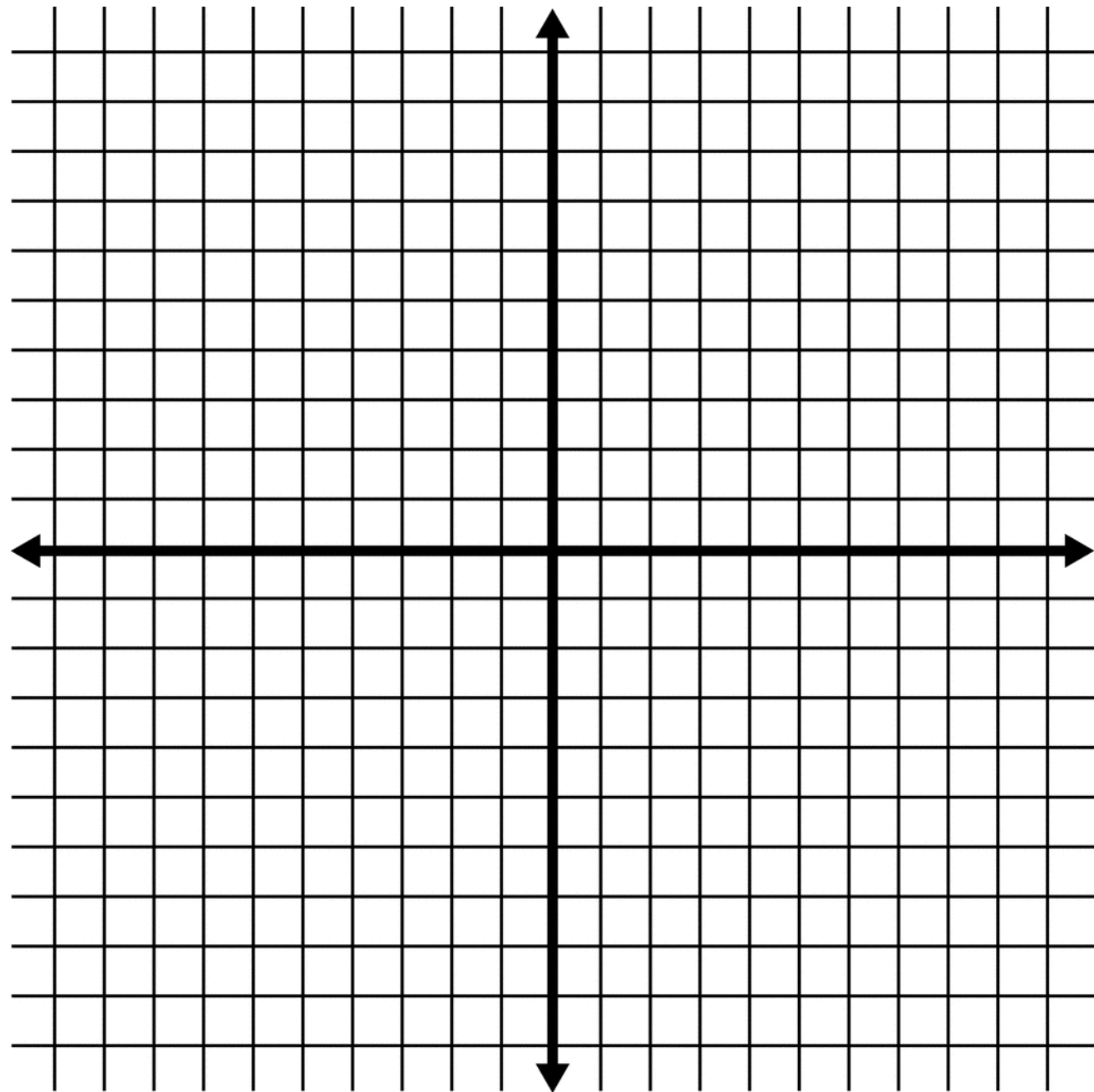


Solve the system of linear equations:

$$\begin{cases} 3x + 2y = 2 \\ 2x - 3y = -16 \end{cases}$$

x =

y =



Homework!

Active Assignments



Week 8

To begin, select an activity from All Activities

Select New Activity 



All Activities

Completion: 0/5 (0%)



No Due Date

Student question from PLATO - factoring

We have three kinds of terms:

Coefficient (number); m (variable), n (different variable)

$$-15m^3n - 40m^5n^4$$

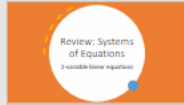
$$-5 (3m^3n + 8m^5n^4)$$

$$-5m^3(3n + 8m^2n^4)$$

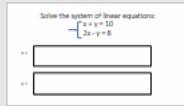
$$-5m^3n (3 + 8m^2n^3)$$



29



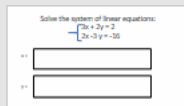
30



31



32



33



34



35



We have three kinds of terms:

Coefficient (number); m (variable), n (different variable)

Between -15 and -40,
what is a common
factor?

$$\frac{-15m^3n}{-5} - \frac{40m^5n^4}{-5}$$

$$m^5 = m$$

$$-5(\cancel{3m^3n} + 8\cancel{m^5n^4})$$

$$\cancel{/m^3} \quad \cancel{/m^3}$$

$$\begin{array}{c} m * m * m \\ m * m * m * m * m \end{array}$$

$$\frac{-5m^3(3n + 8m^2n^4)}{n} \quad \frac{-5m^3(3n + 8m^2n^4)}{n}$$

$$\frac{\cancel{n} * n * n * n}{\cancel{n}}$$

$$-5m^3n(3 + 8m^2n^3)$$

Click to add notes