

The Mini Board

5 G 1

These are Mini Board Exercises for use with Grade 5 Coordinate Grids.

For more information on how to make and use these Mini Boards go to:

www.collinsed.com/billatwood.htm

Main Standard Addressed

Geometry

5.G

Graph points on the coordinate plane to solve real-world and mathematical problems.

1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x -axis and x -coordinate, y -axis and y -coordinate).

Additional Standards Addressed

Number and Operations—Fractions

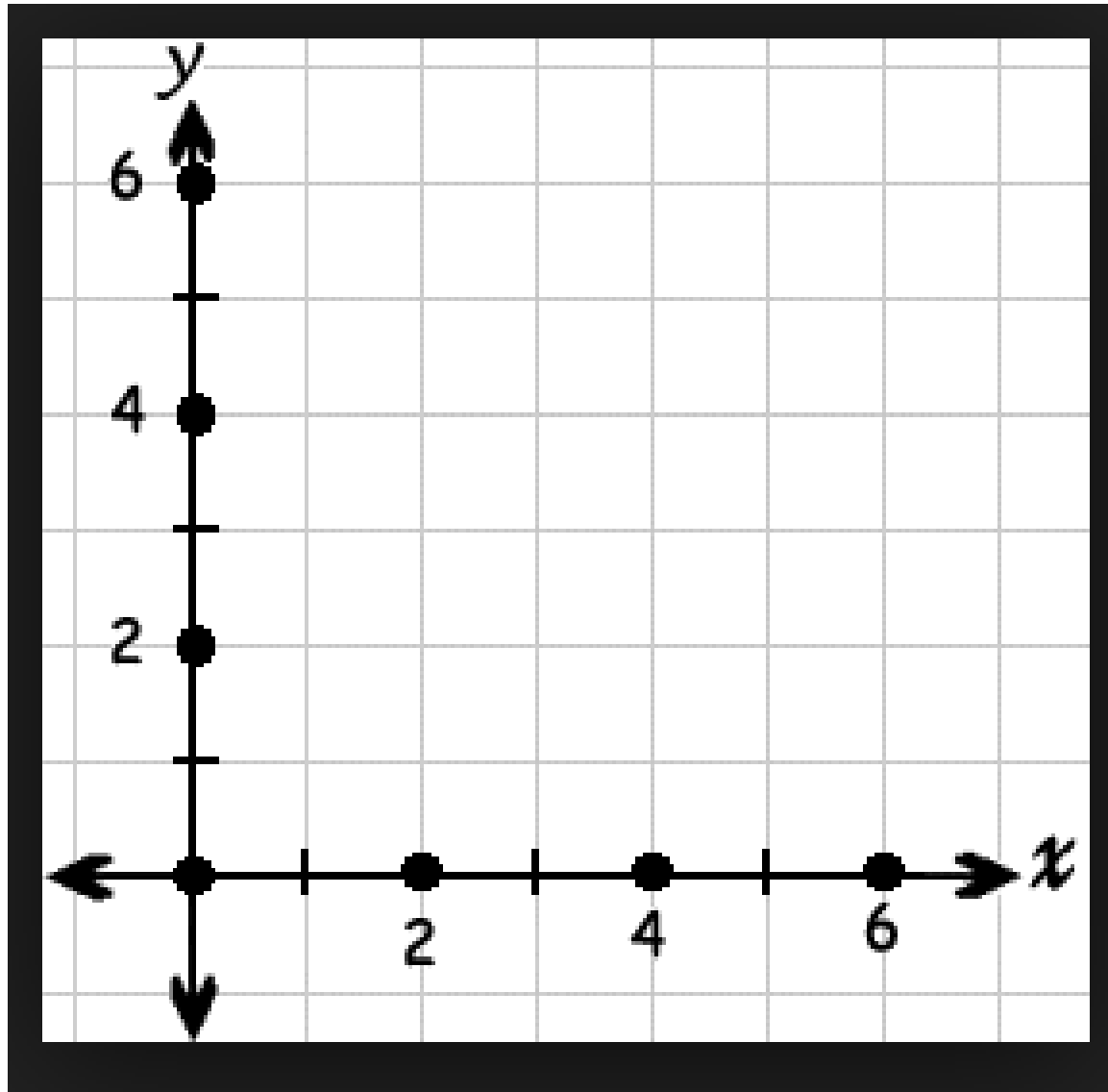
5.NF

4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Teachers: Print the next slide and then have students insert it into their Mini Boards.

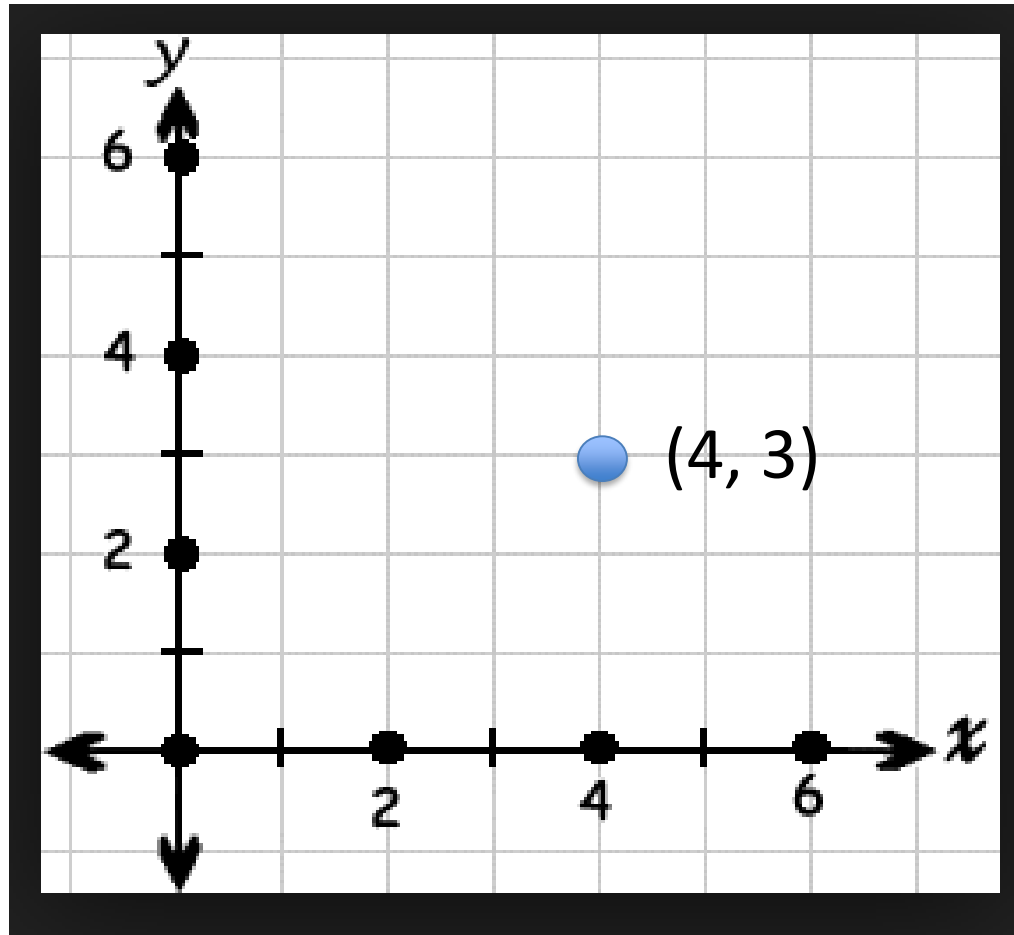


Type One Writing:

Write down 3 or more important math words about the graphic below. Or write 3+ things that you notice.

Possible Word Bank

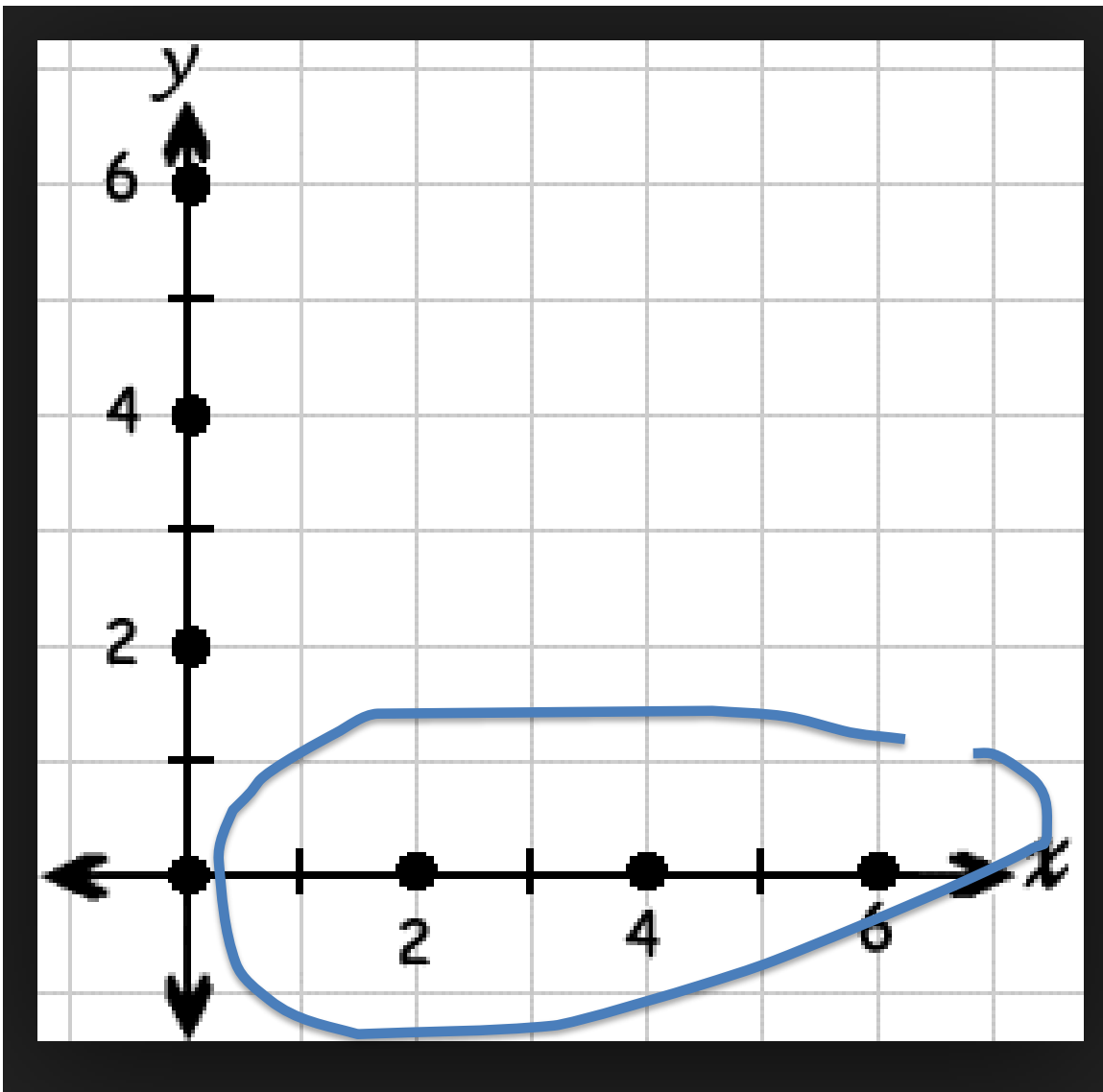
1. graph, grid
2. lines
3. Point
4. Intersect
5. perpendicular
6. x, y axis
7. location
8. arrows
9. ordered pair
10. distance
11. plot
12. units
13. scale
14. negative, positive



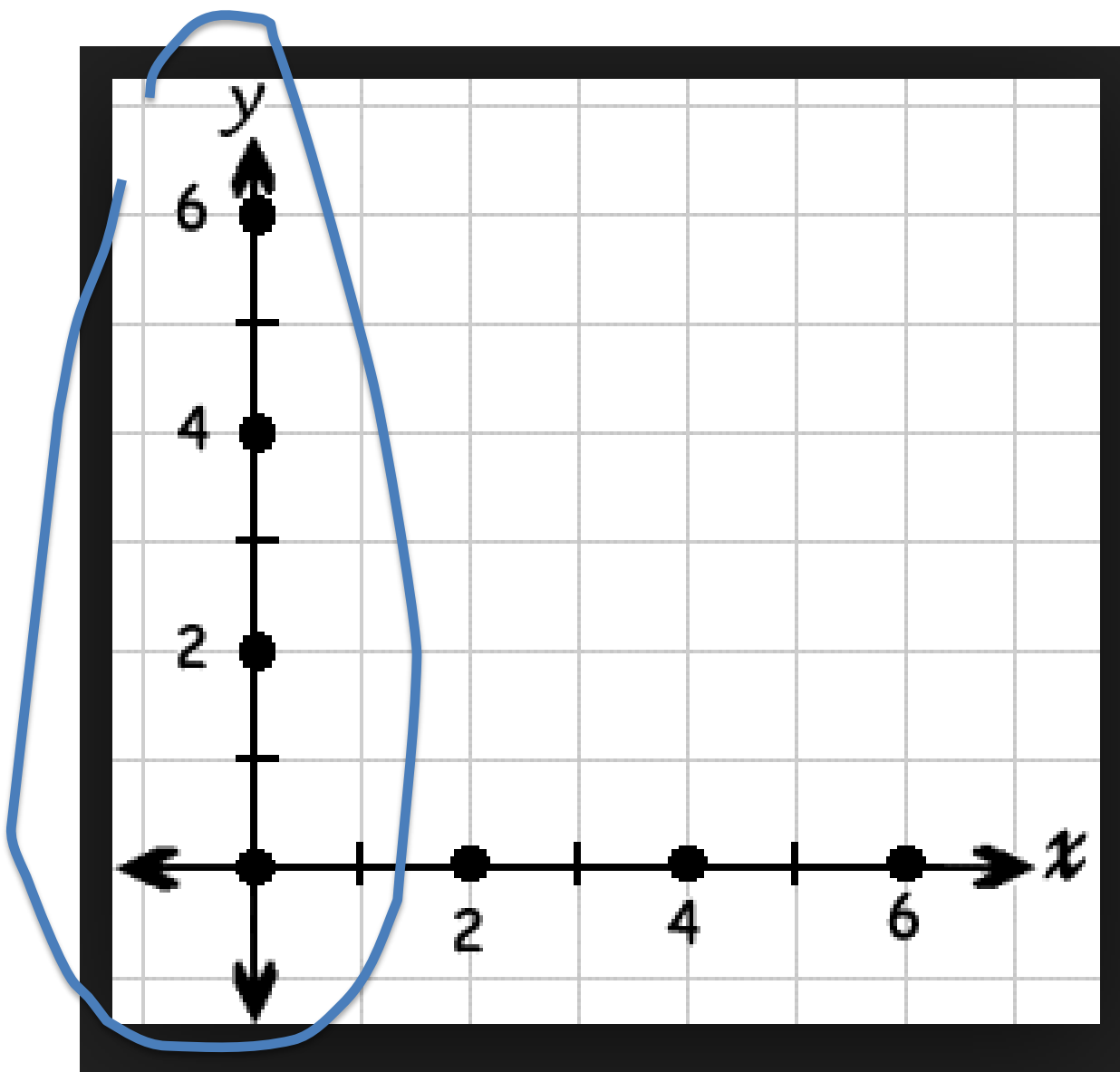
Next, build on what students wrote. Teach students about the coordinate grid, the key vocabulary, and how it can be used to show locations.

Describe real world situations with grids: rows and aisles for seats on planes and concert halls; latitude and longitude; game of Battleship...

Next ask students to solve the following problems on their Mini Boards. Tell them, “Check with a partner to make sure you both have it! And on my signal, hold up your Mini Boards. So I can check the answers and clarify errors.”



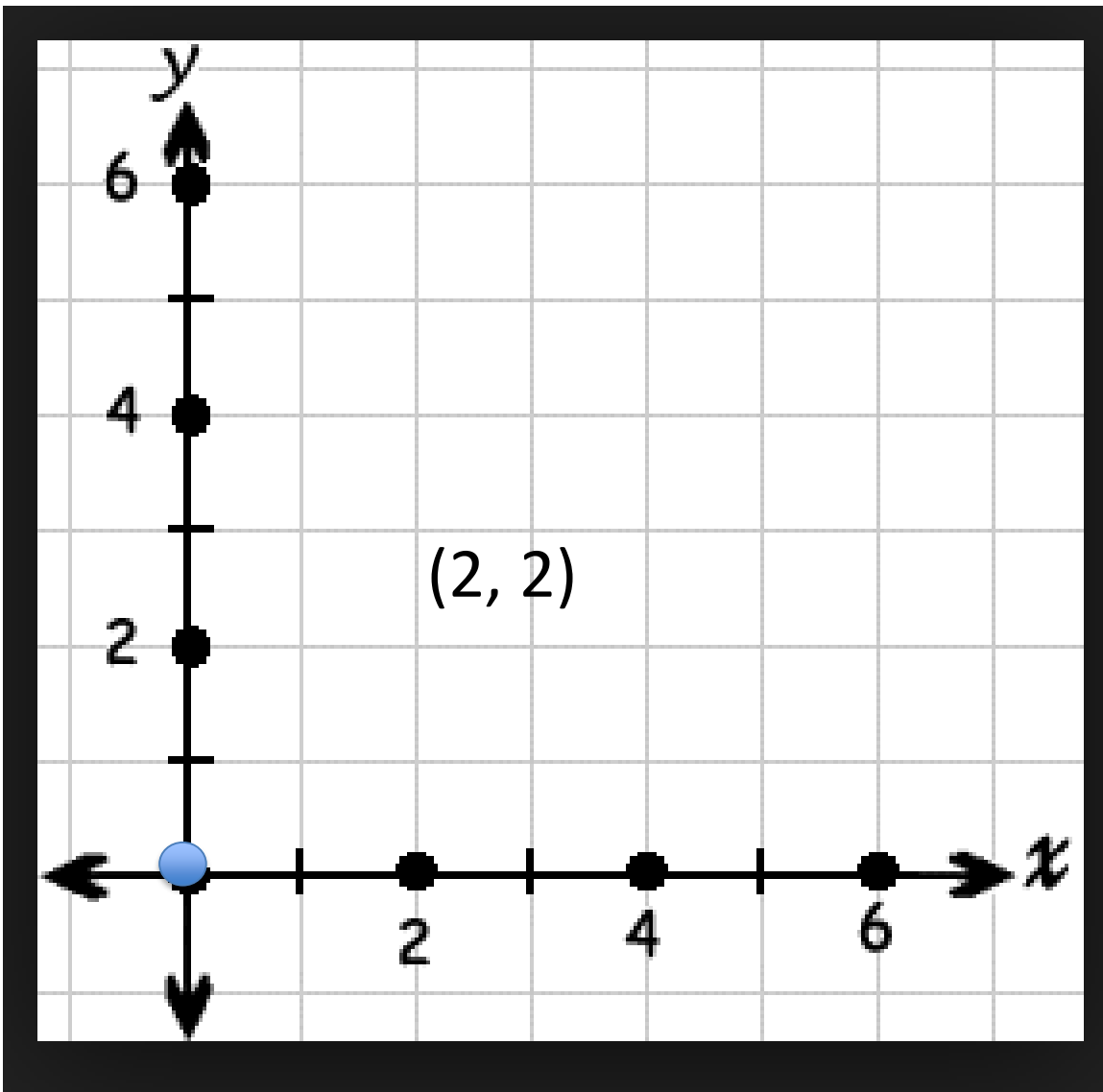
Circle the x
axis



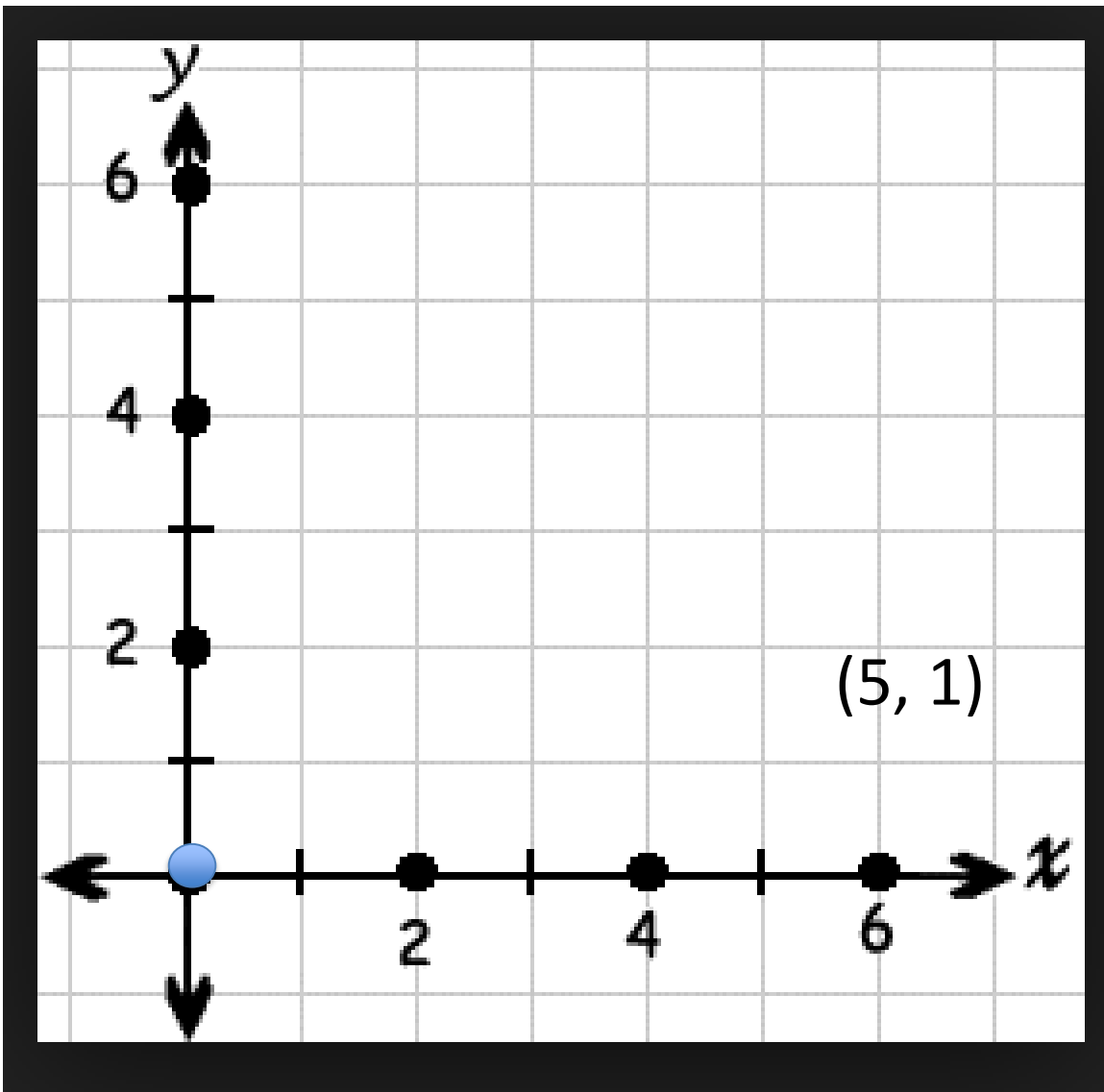
Circle the **y**
axis

Are the axis
parallel or
perpendicular?

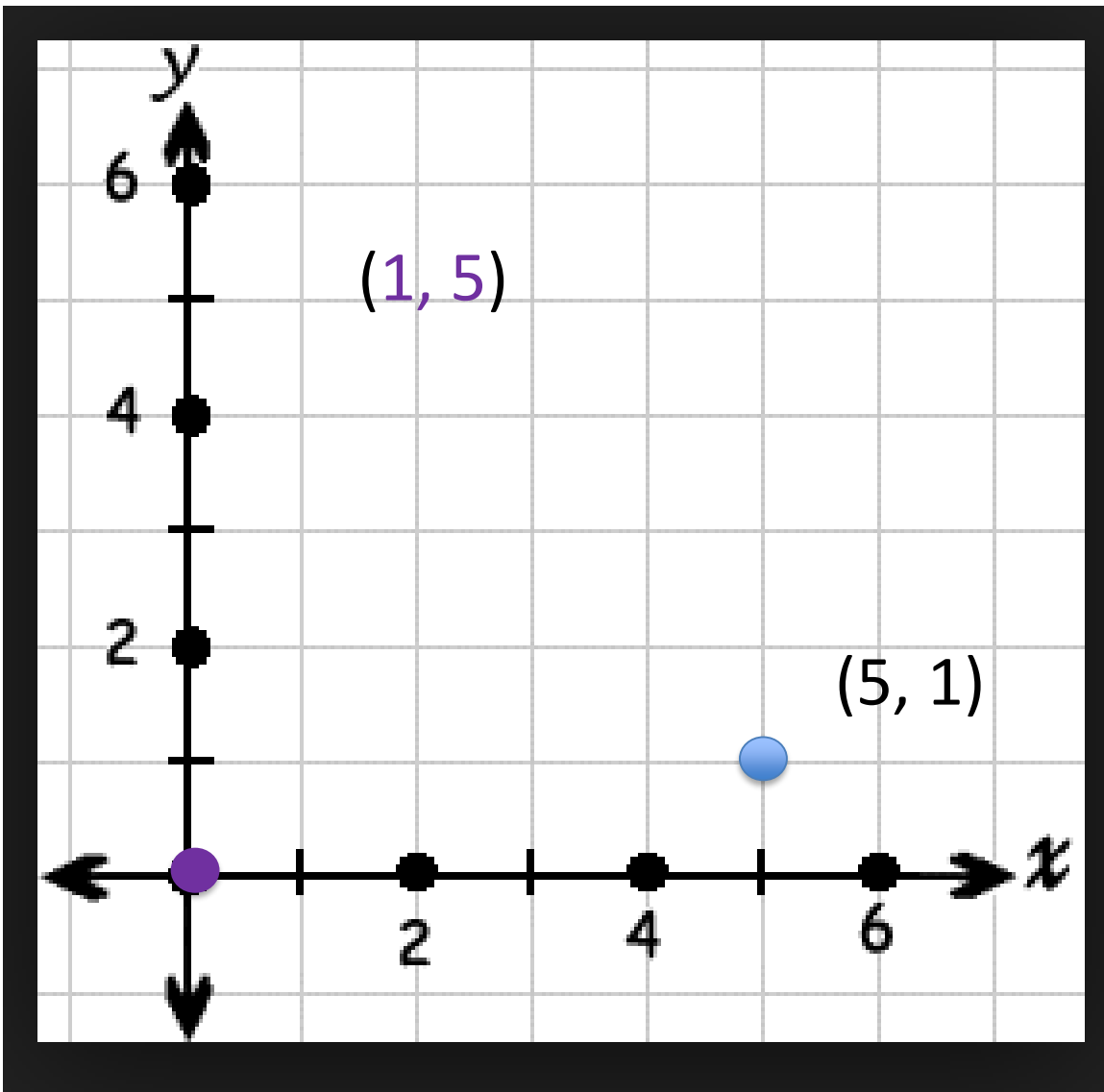
Perpendicular. They
meet and form a
right angle (90
degrees).



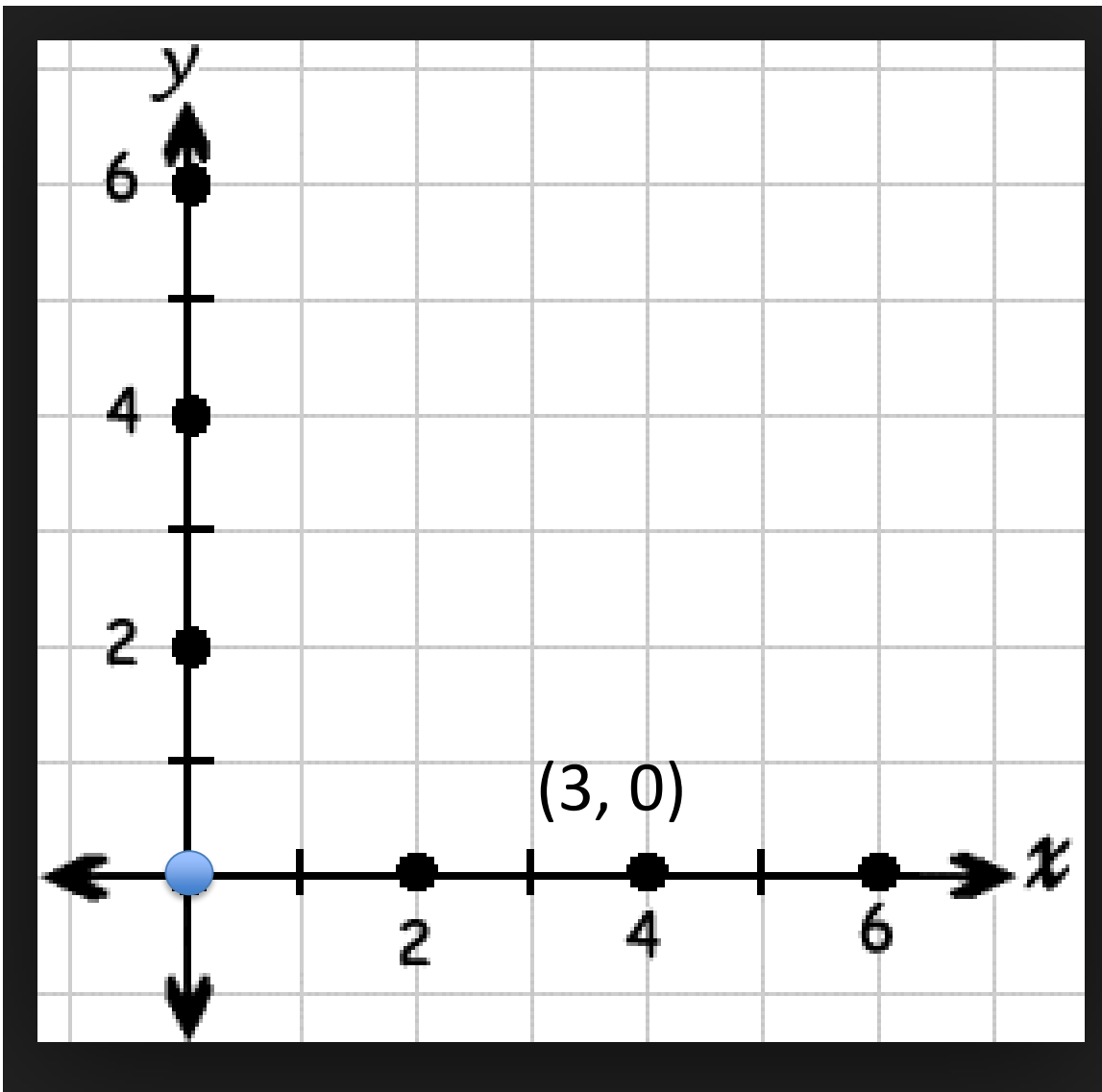
Plot and label
the **point** (2, 2)



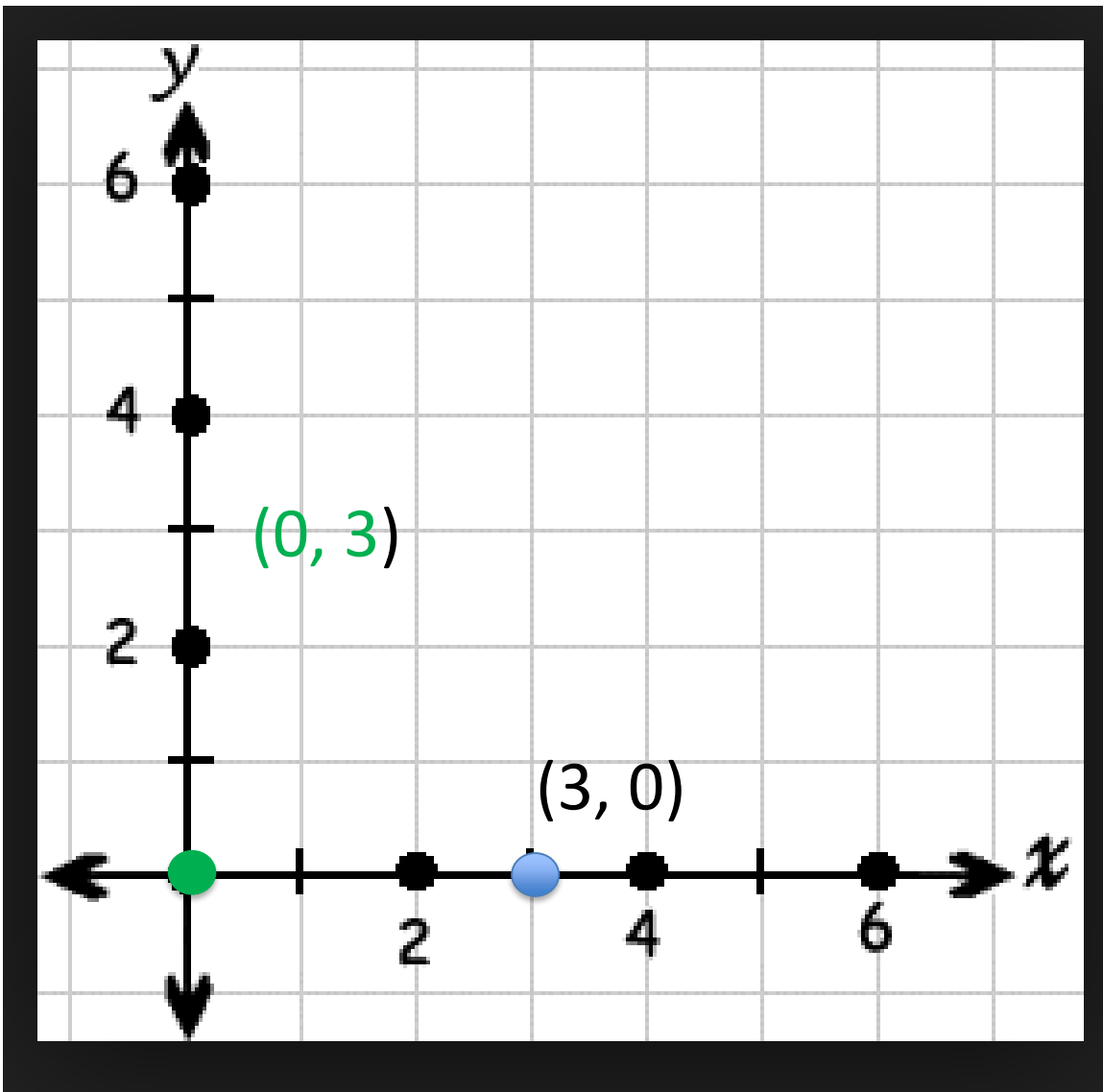
Plot and label
the **point** (5, 1)



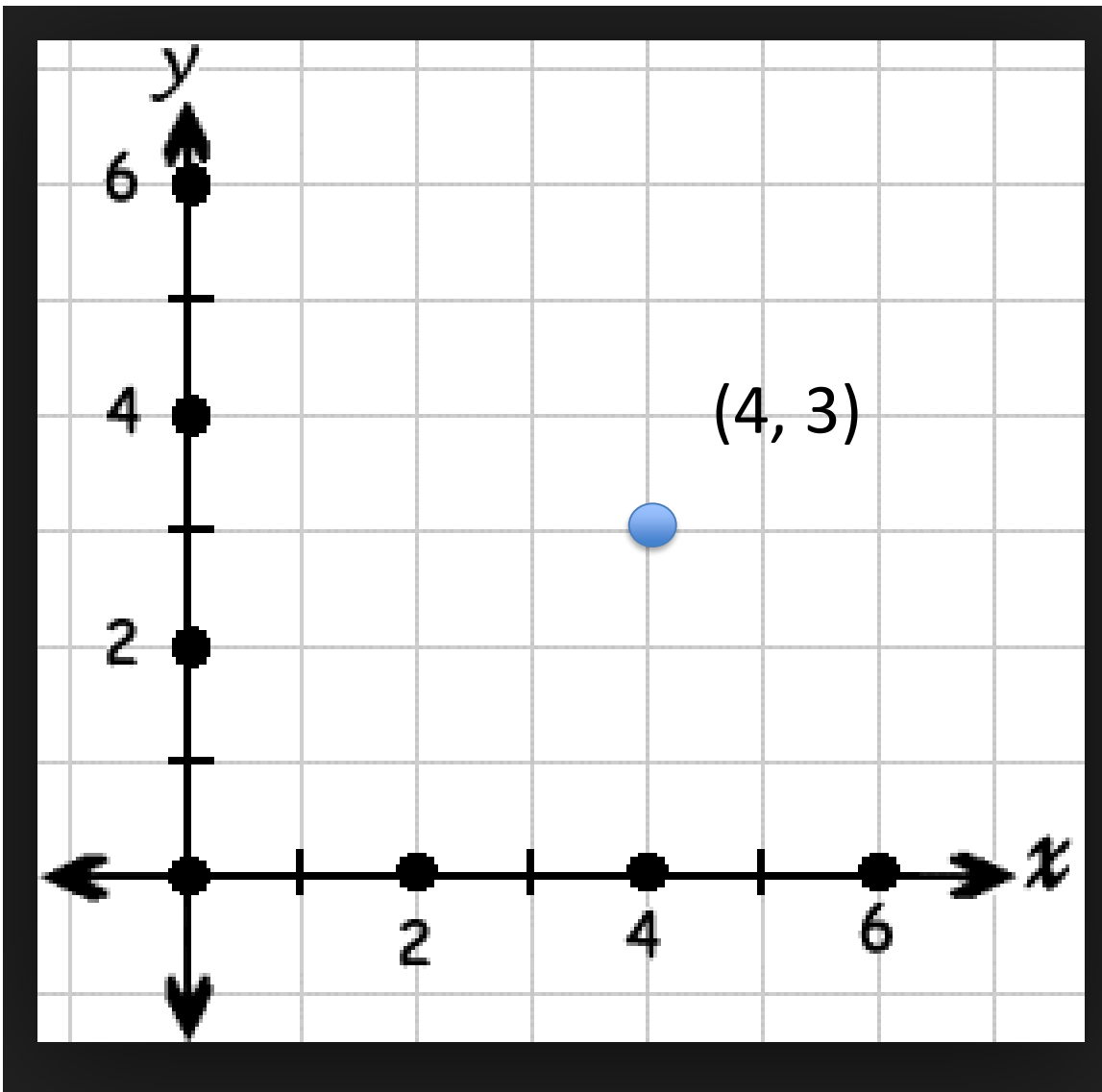
Plot and label
the point (1, 5)



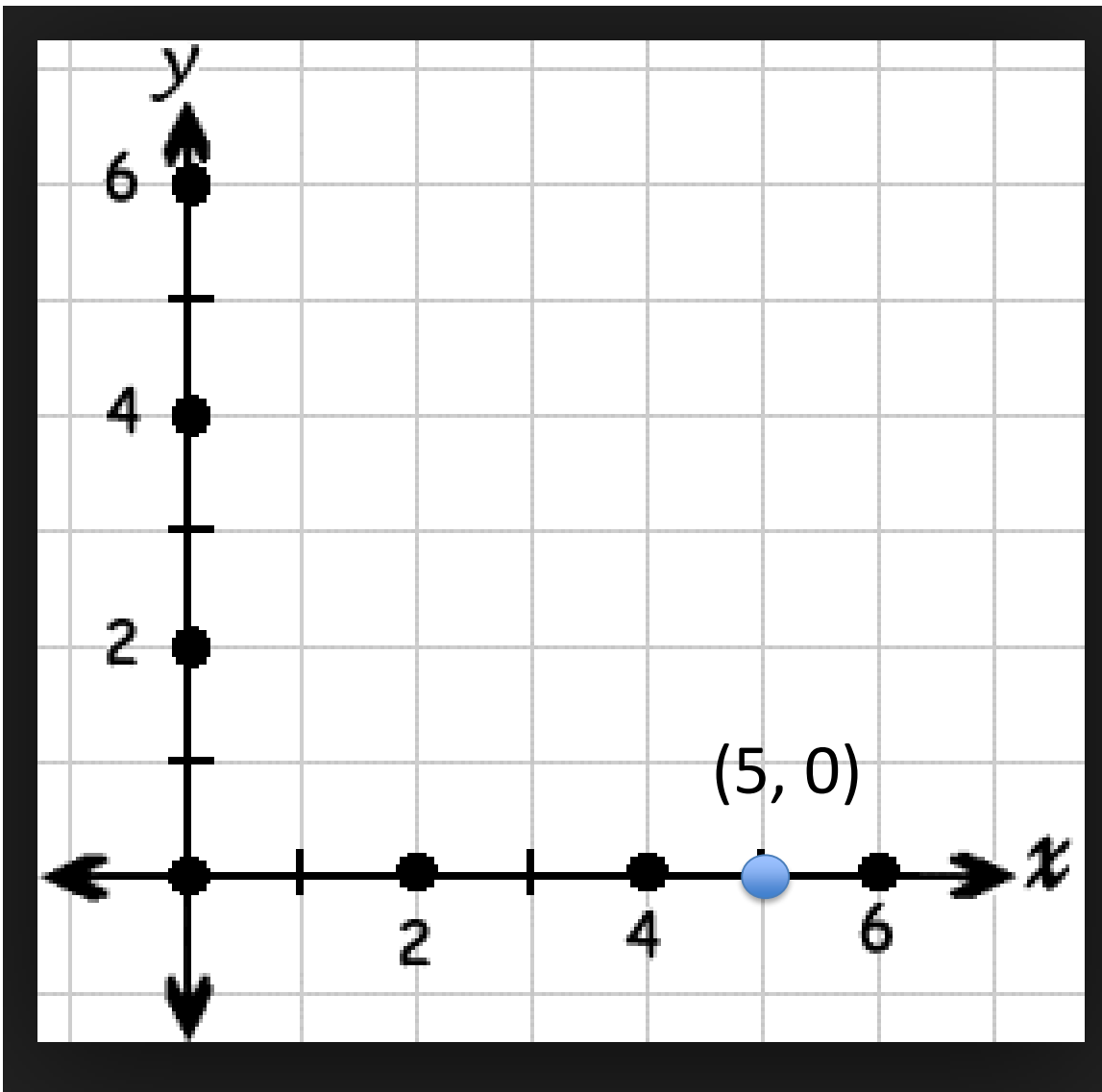
Plot and label
the **point** (3, 0)



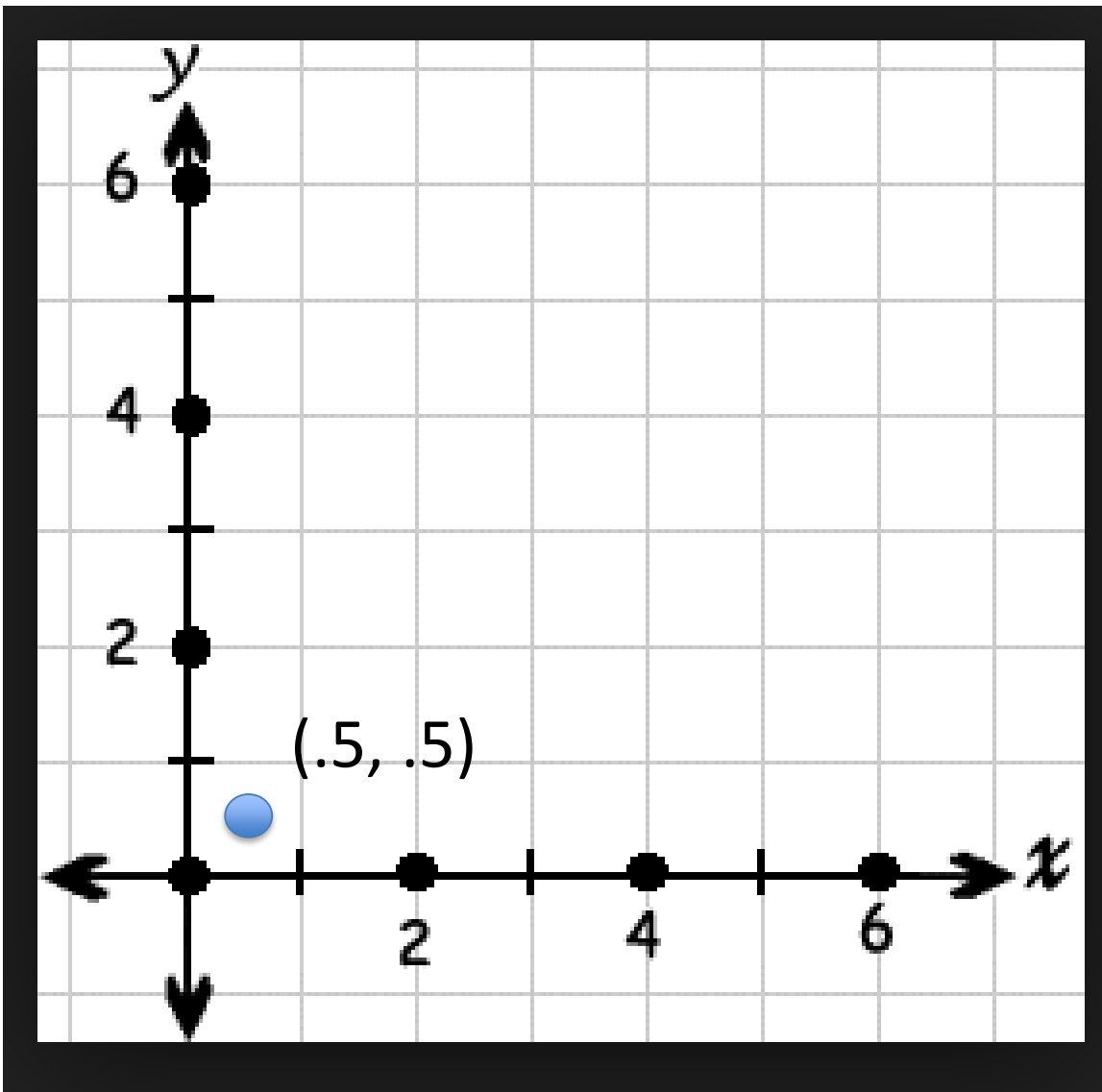
Plot and label
the point (0, 3)



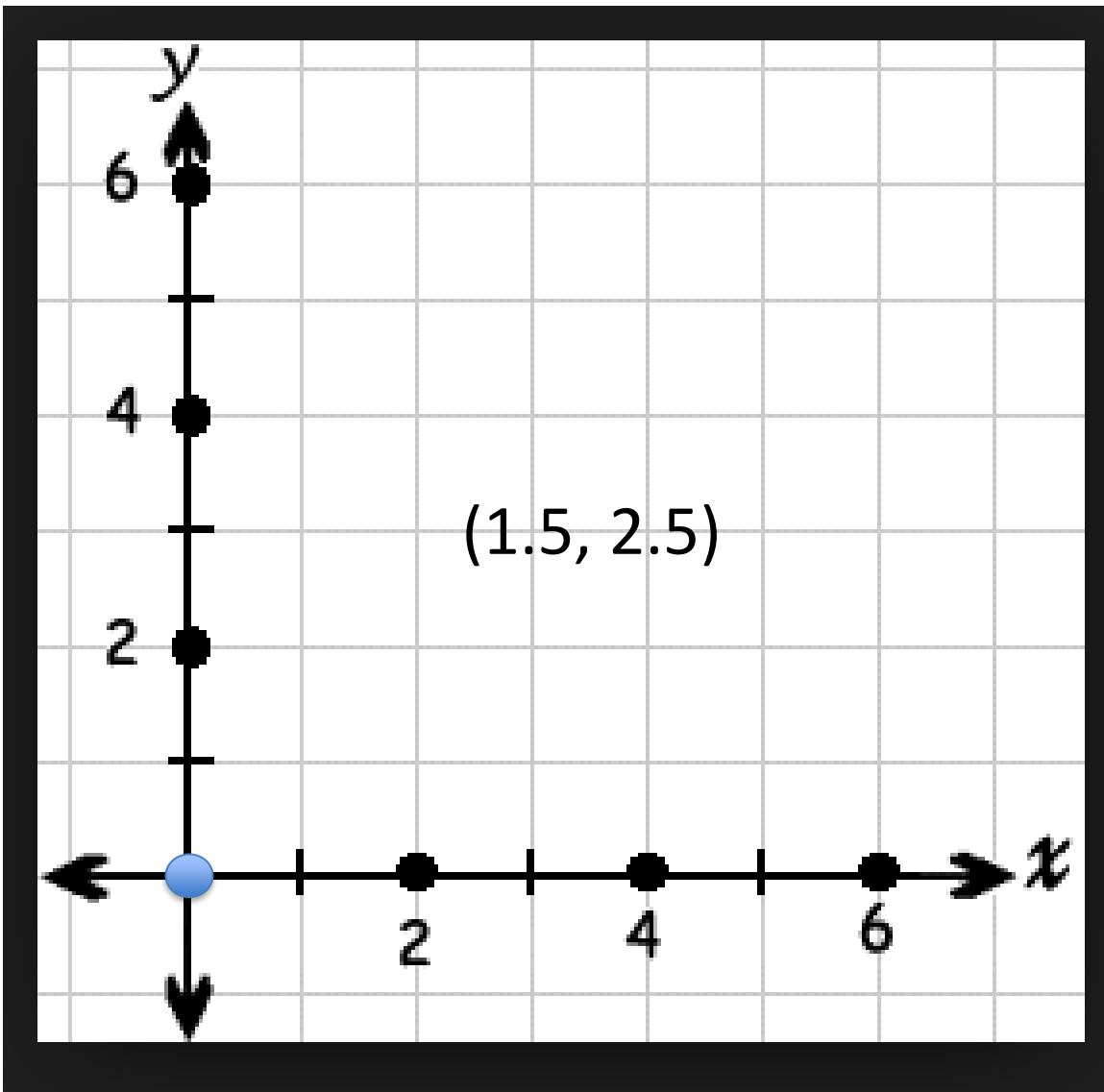
Identify
coordinate
points or
ordered pairs
for this point.



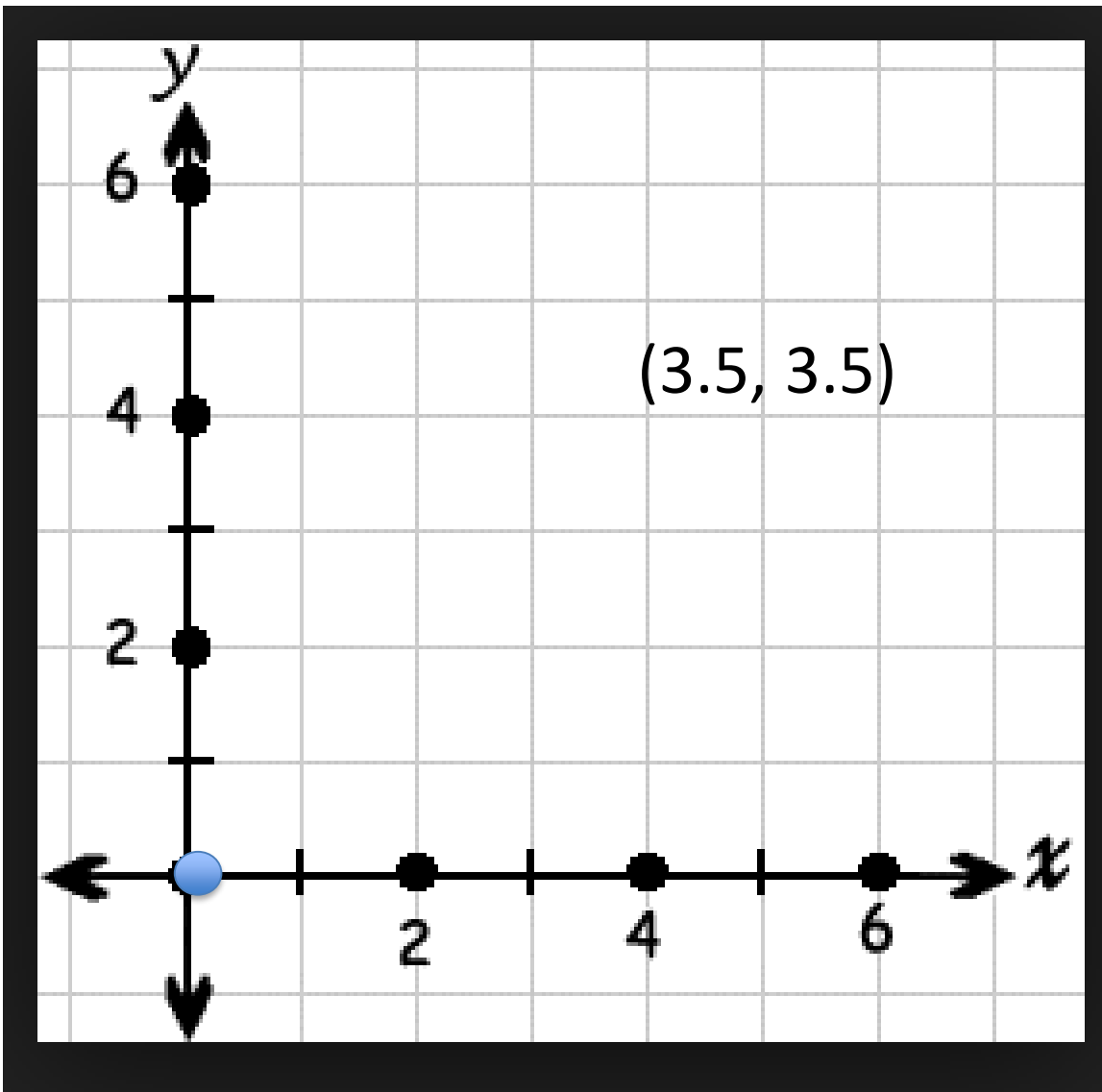
Identify
coordinate
points or
ordered pairs
for this point.



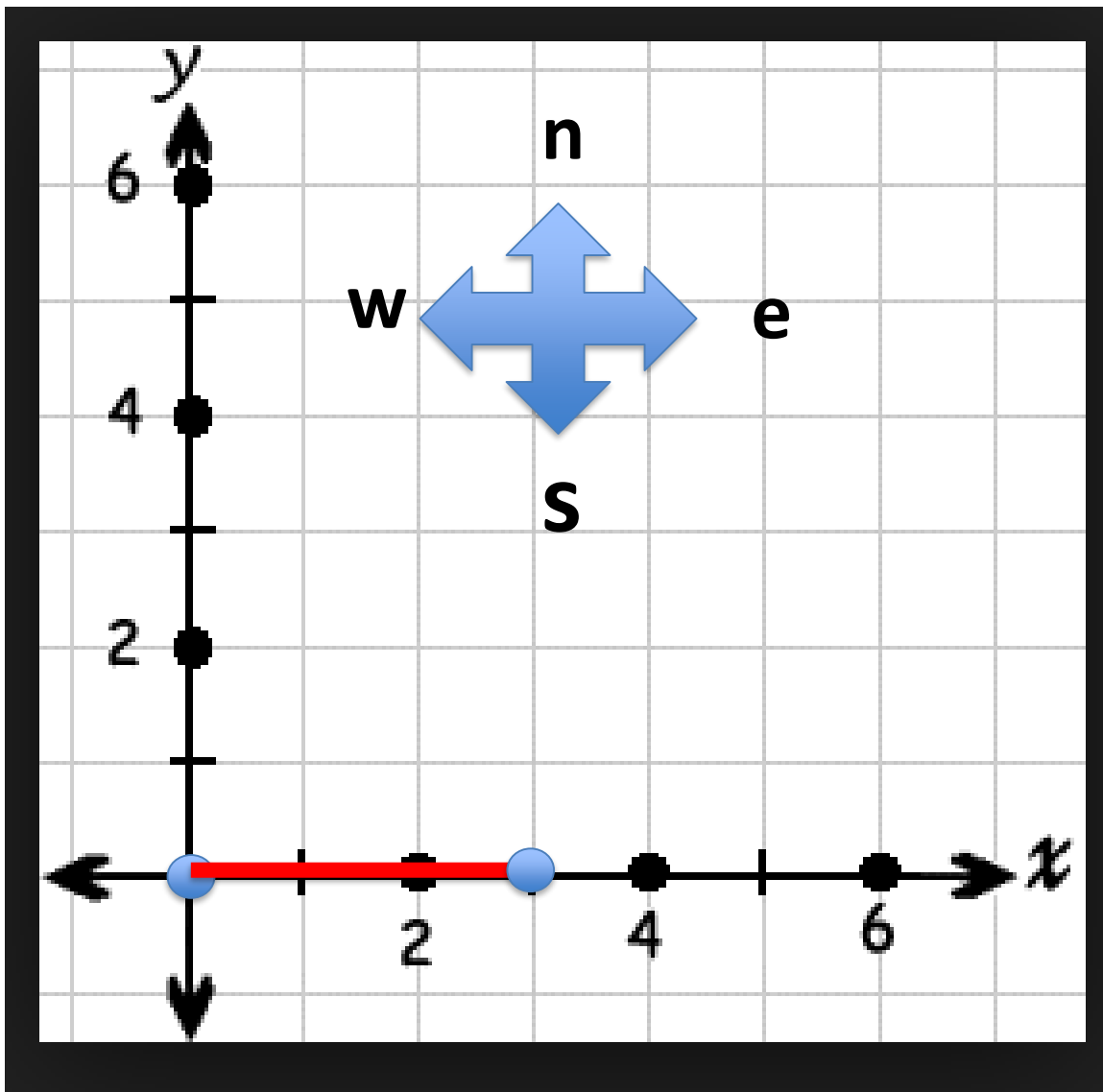
Identify the
coordinate points
or ordered pairs
for this point.



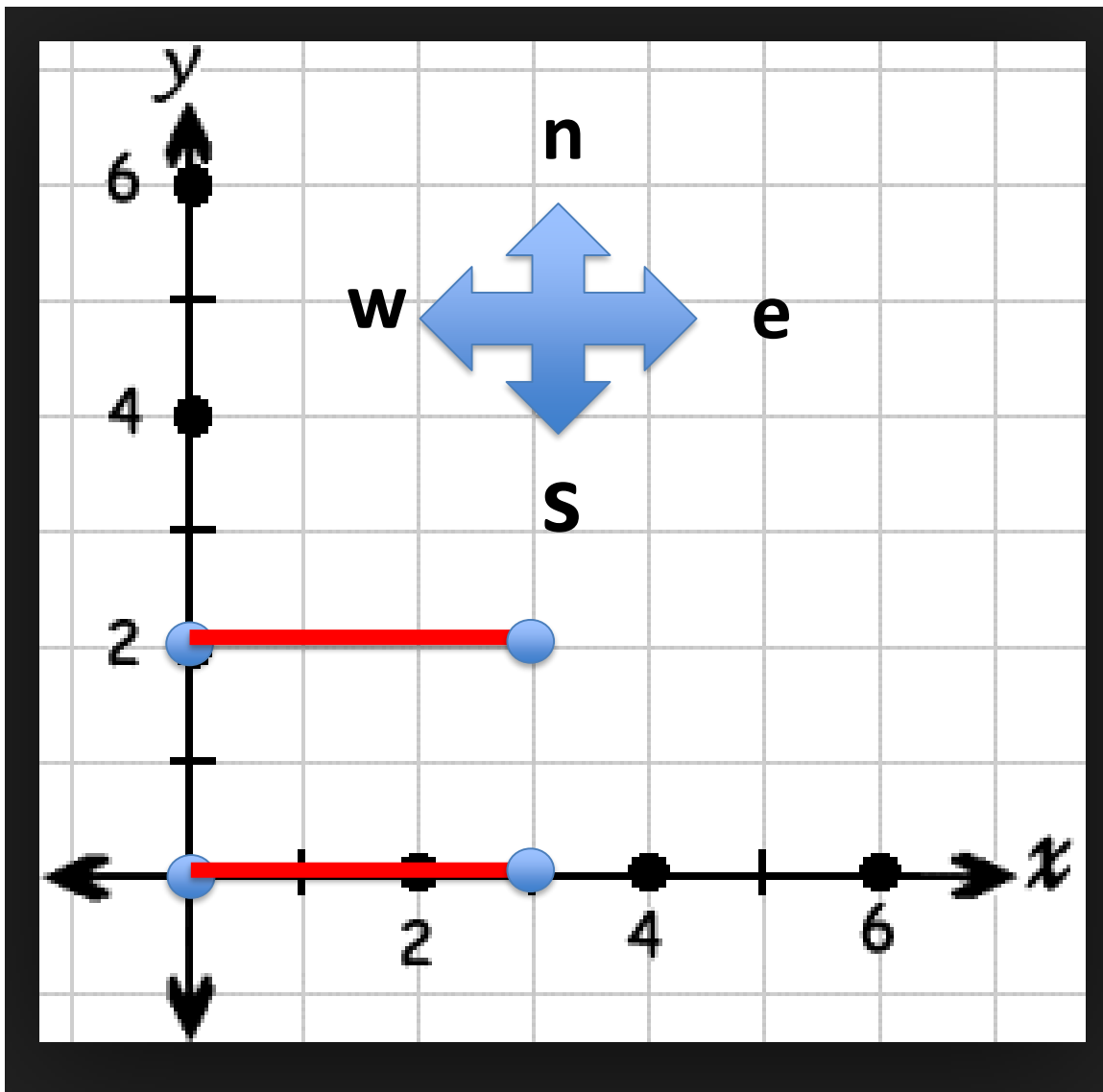
Plot and label the
point (1.5, 2.5)



Plot and label the
point (3.5, 3.5)



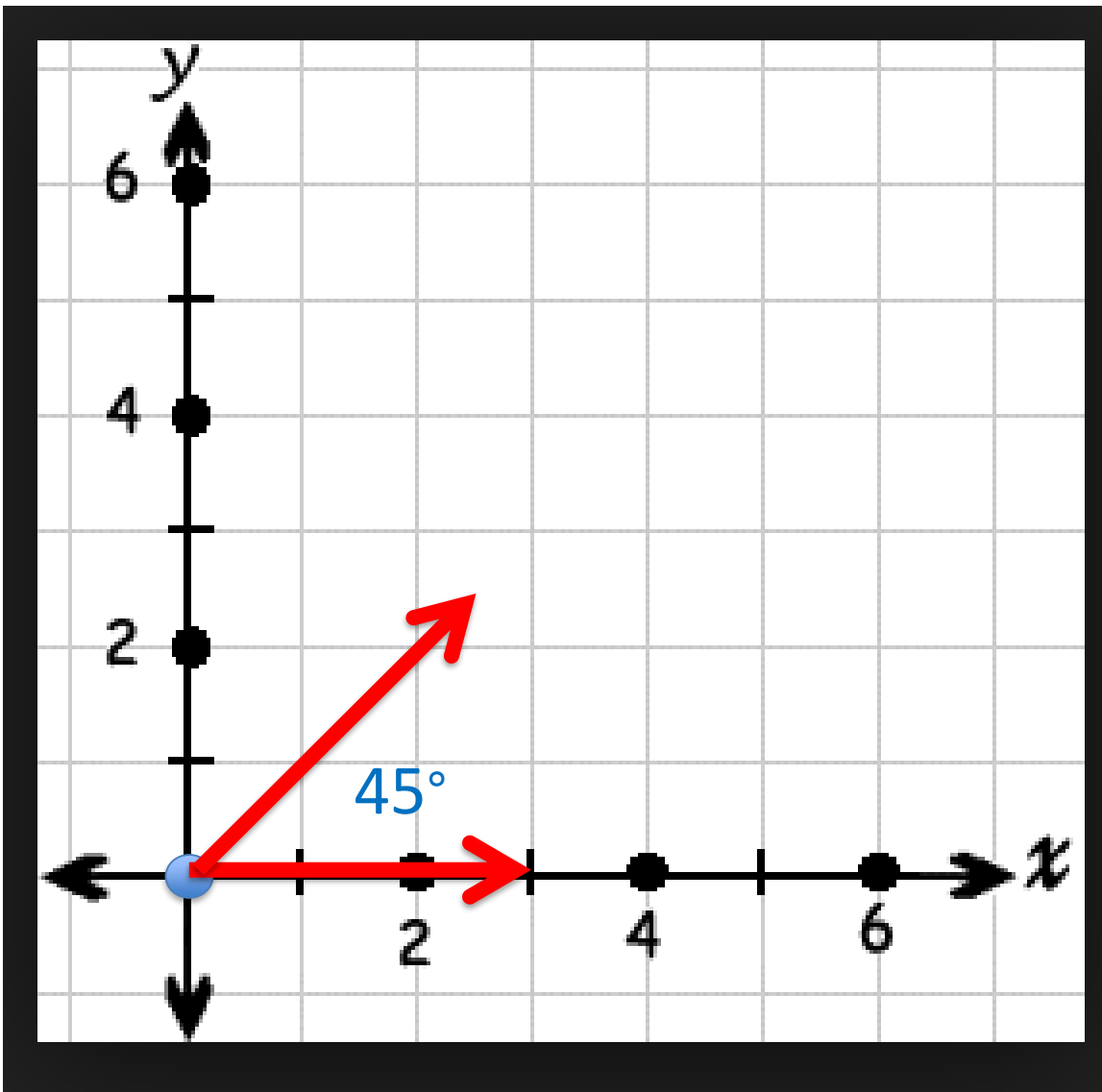
Imagine your house is at the location $(0,0)$. You walk 3 miles east. Draw the line segment that shows your path.



Imagine your friend's house is at $(0,2)$. Your friend walks the same distance East. Draw the line that shows the path.

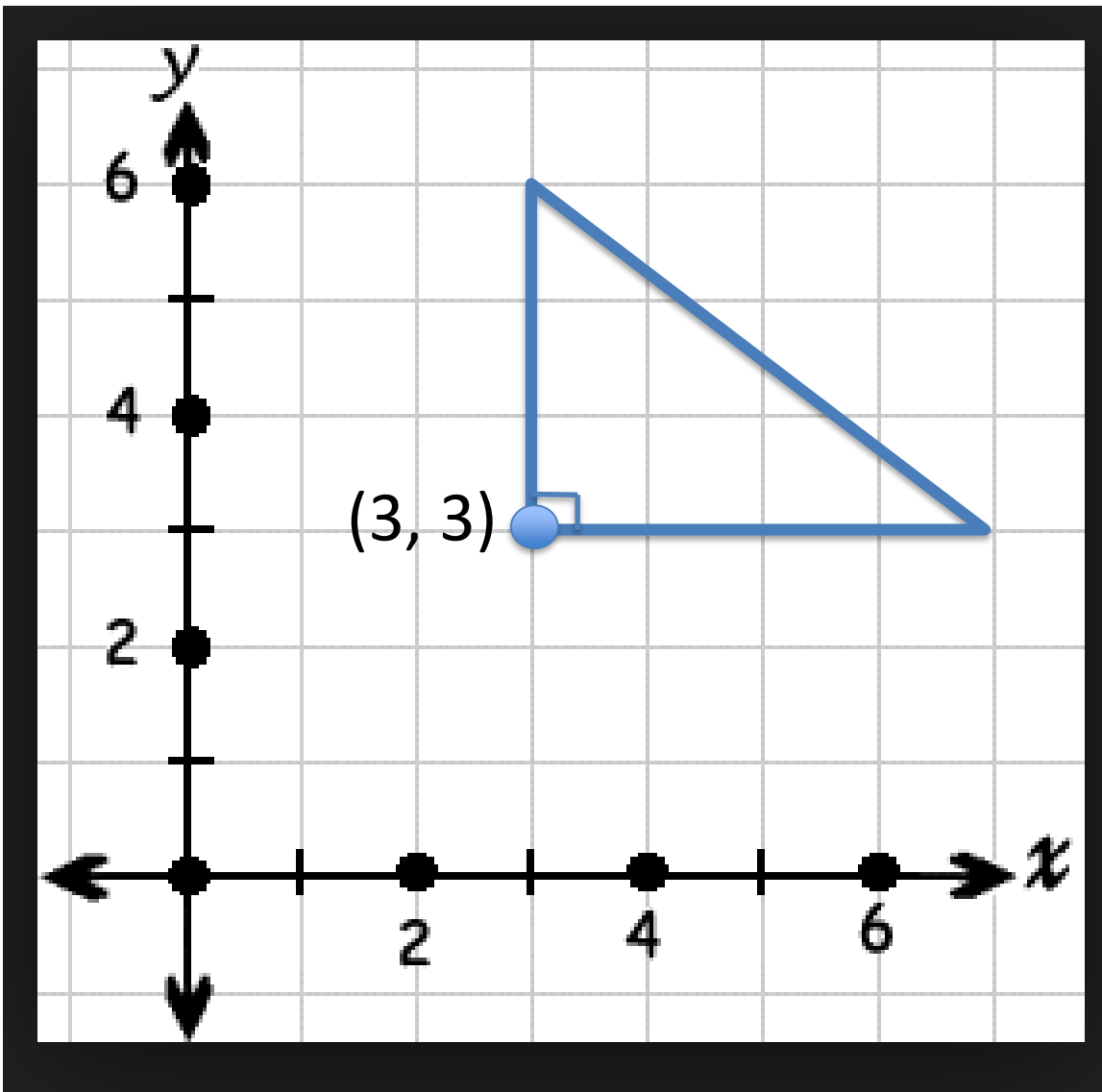
Write a geometric term which describes these non-intersecting line segments.

The line segments are parallel.

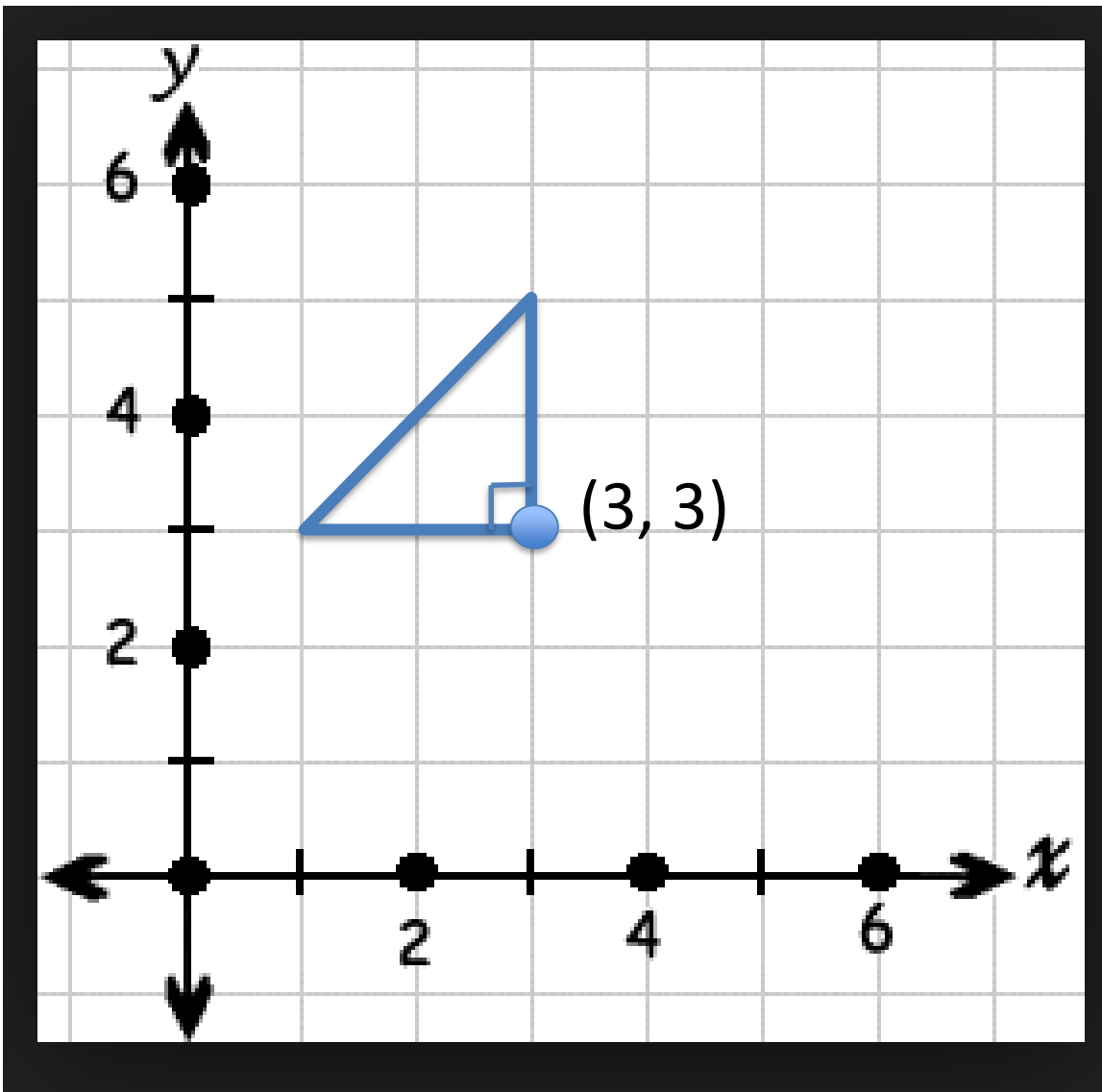


Draw an acute angle with a vertex at (0,0)

Estimate the degrees.

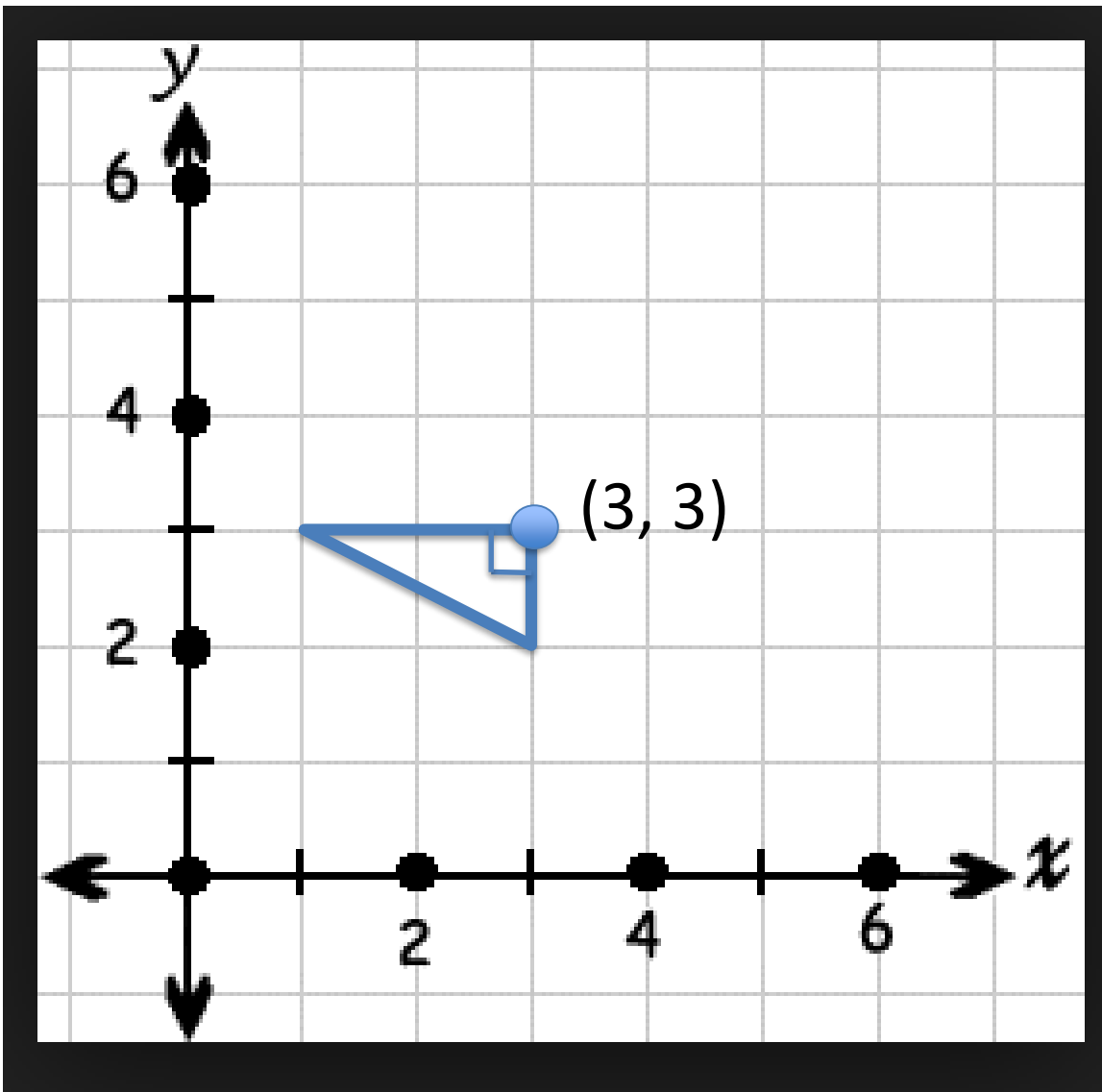


Draw a right triangle with a right angle vertex at $(3,3)$. Label the vertex.

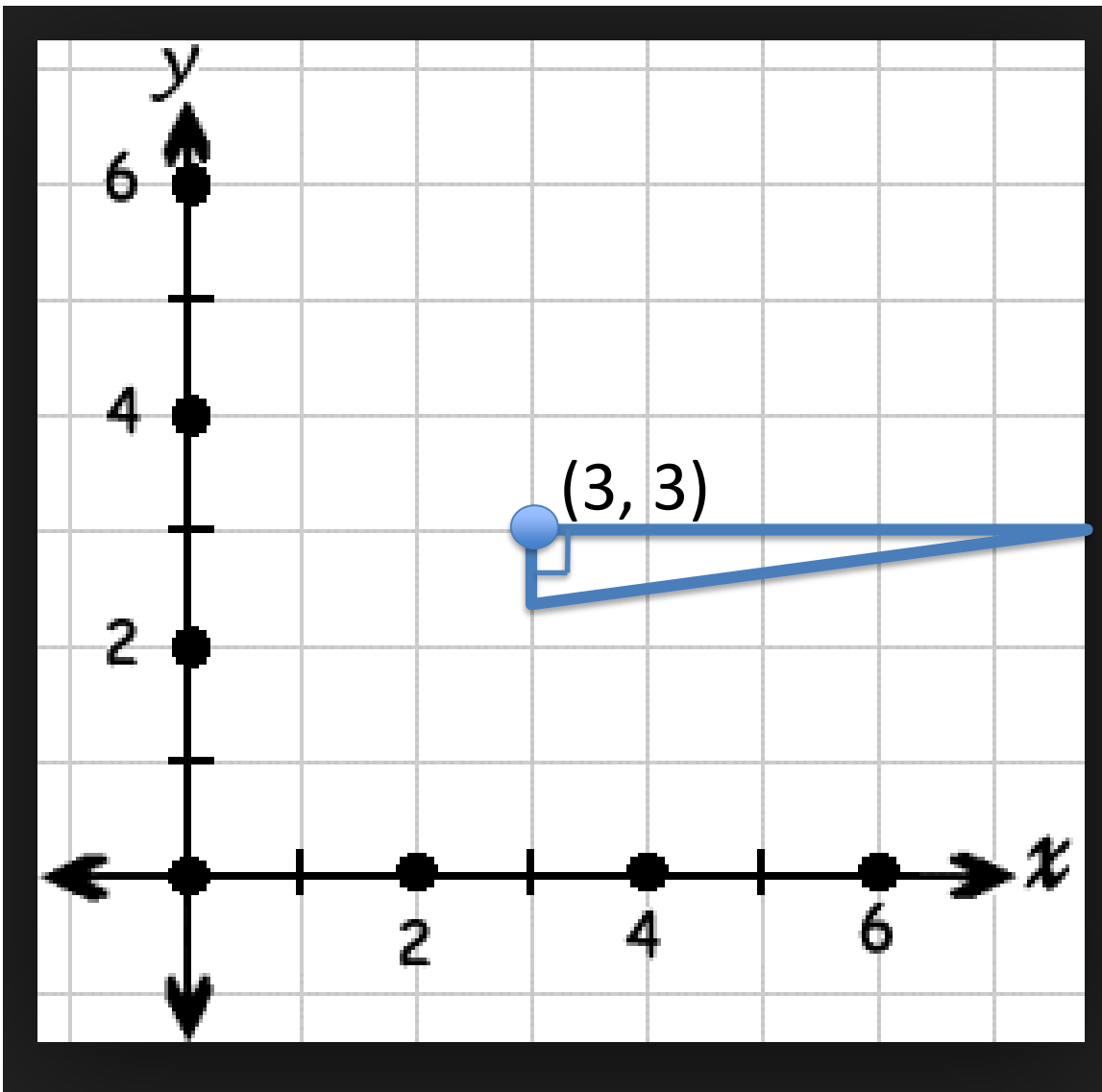


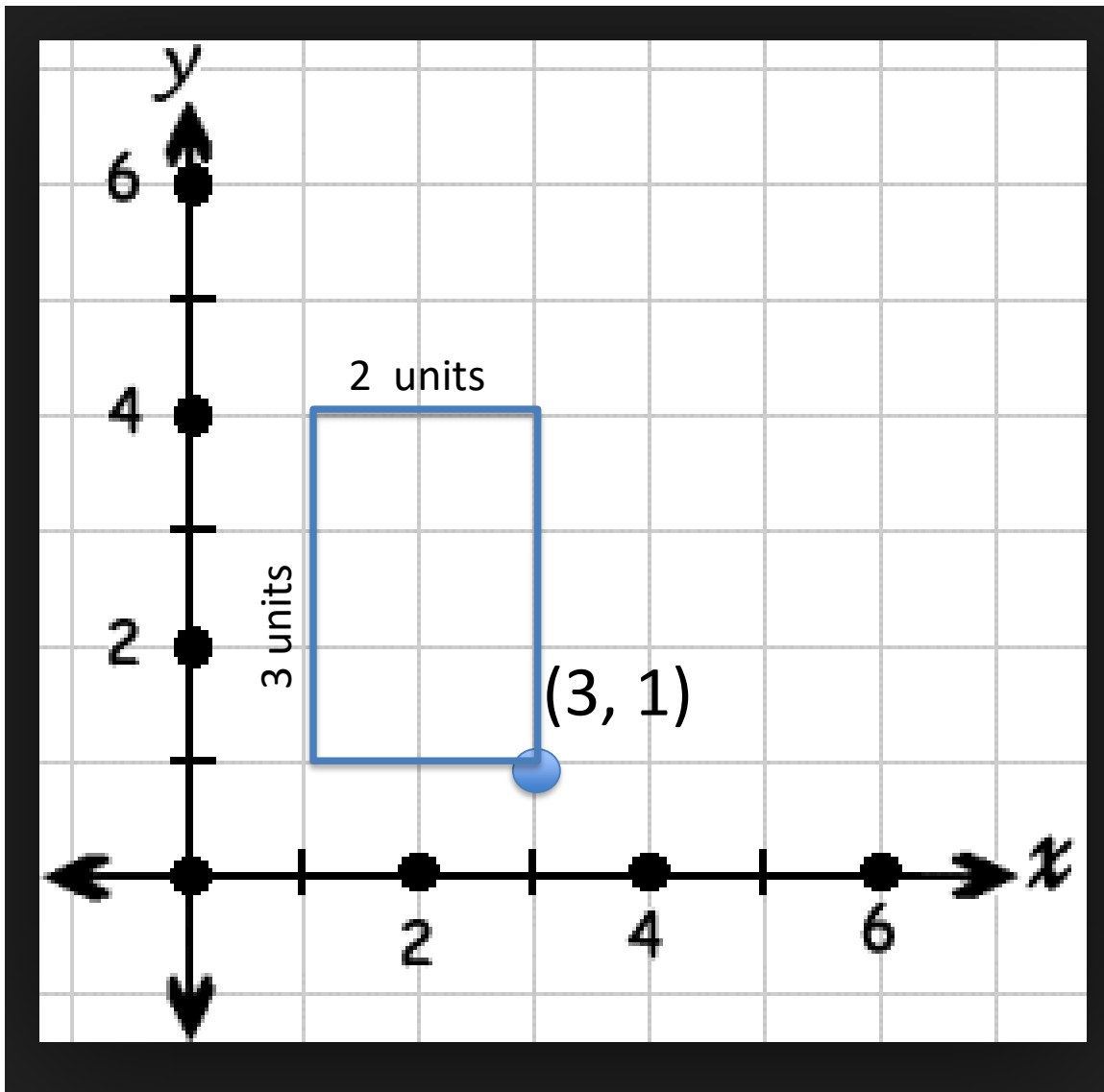
Another
solution

Another
solution



Another
solution





Draw a rectangle with a vertex at (3,1) and an area of 6 square units.

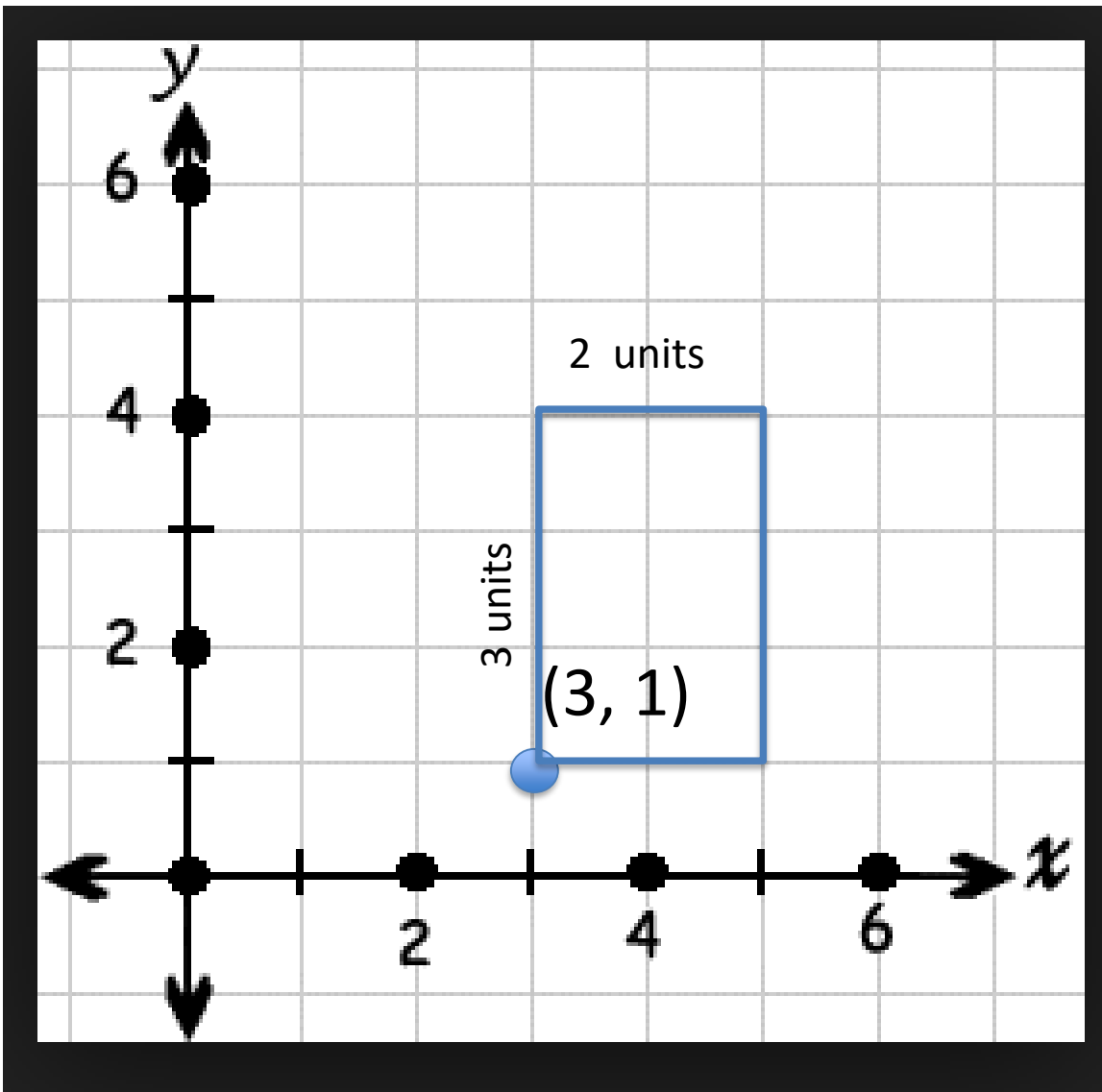
Please label the length and width.

Area = Length X Width

$$A = 3u \times 2u$$

$$A = 6 \text{ Square Units}$$

$$A = 6 u^2$$



Another solution

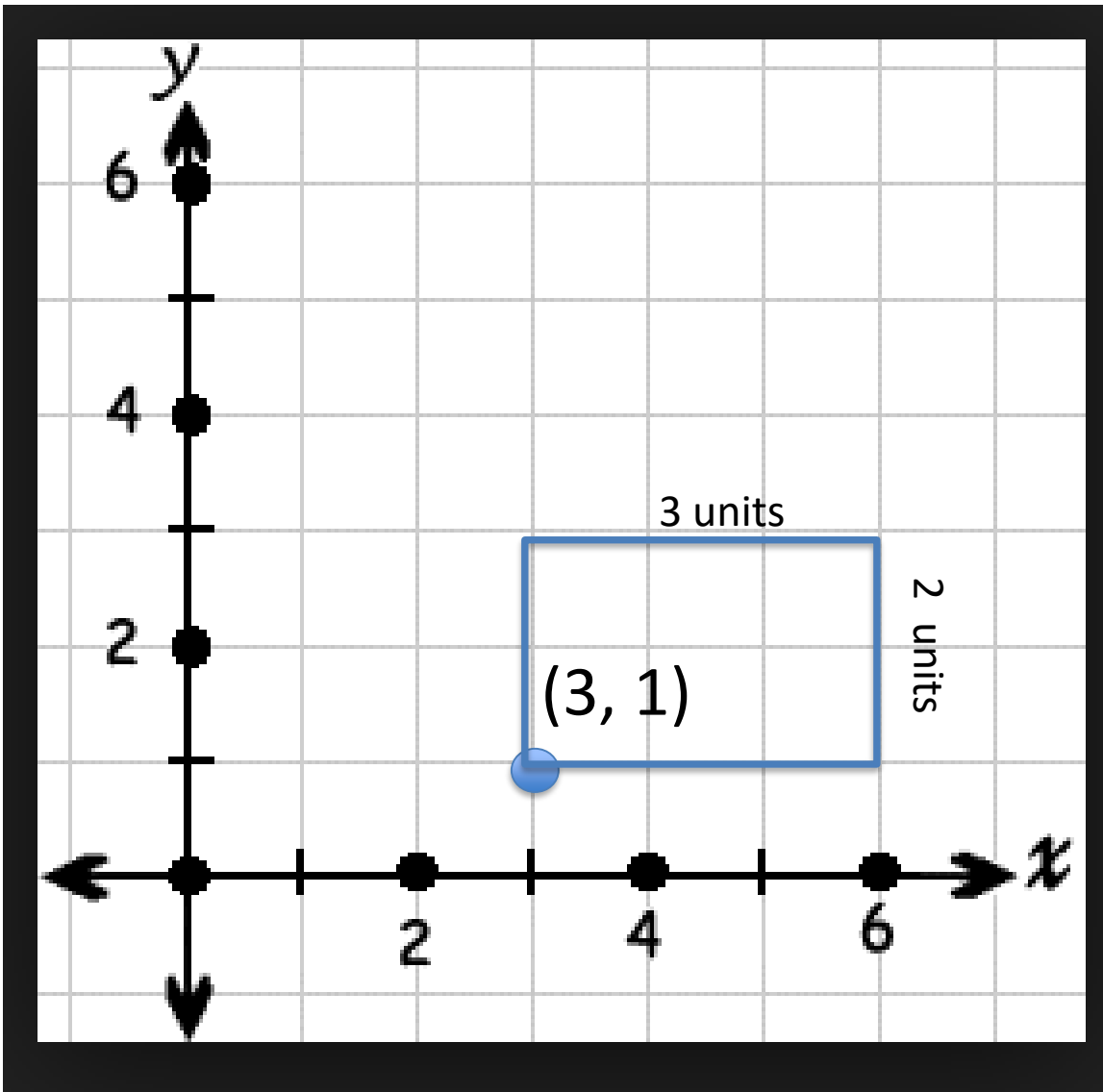
Area = Length X Width

$$A = 3u \times 2u$$

$$A = 6 \text{ Square Units}$$

$$A = 6 u^2$$

Another solution



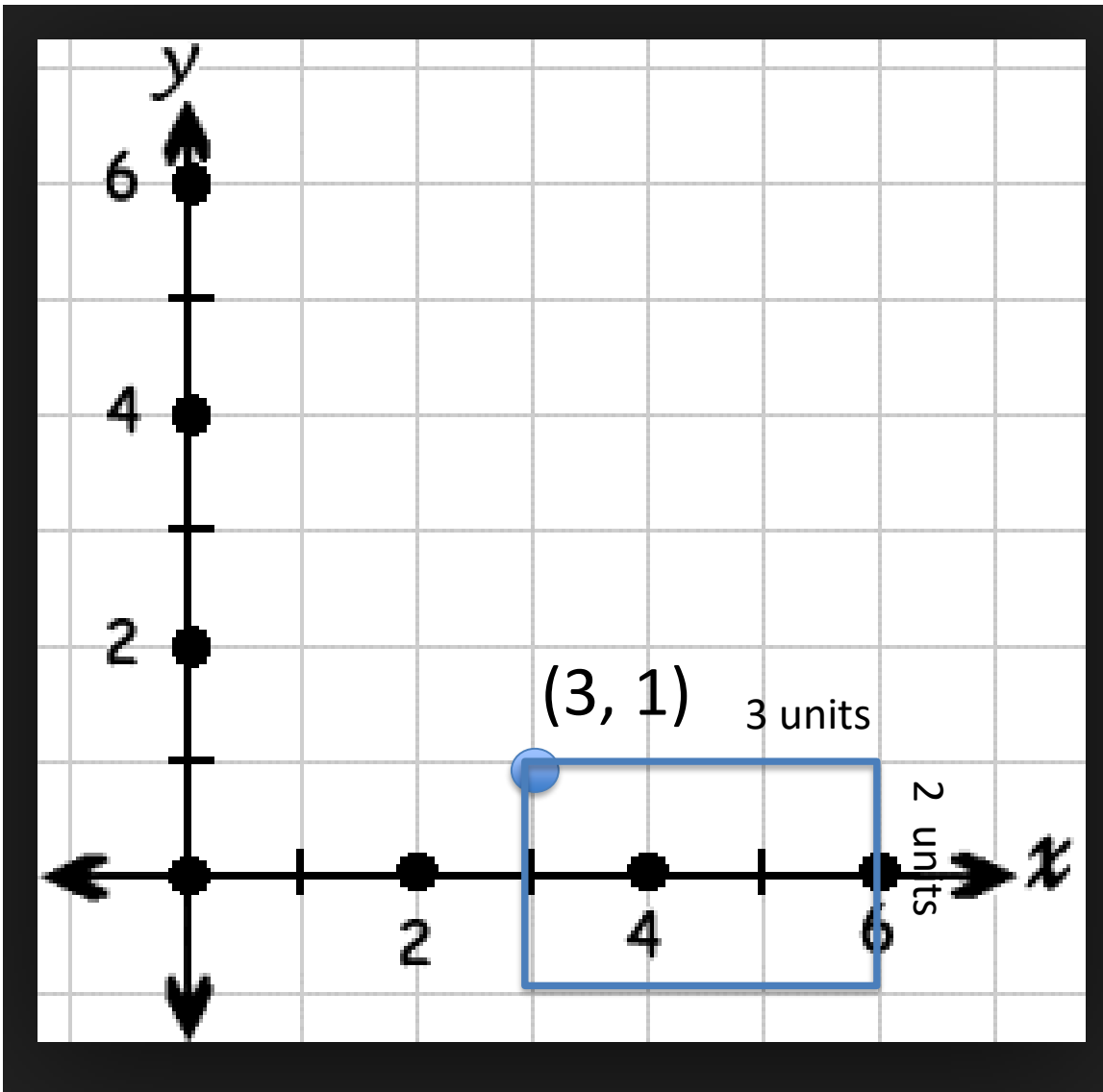
Area = Length X Width

$$A = 3u \times 2u$$

$$A = 6 \text{ Square Units}$$

$$A = 6 u^2$$

Another solution

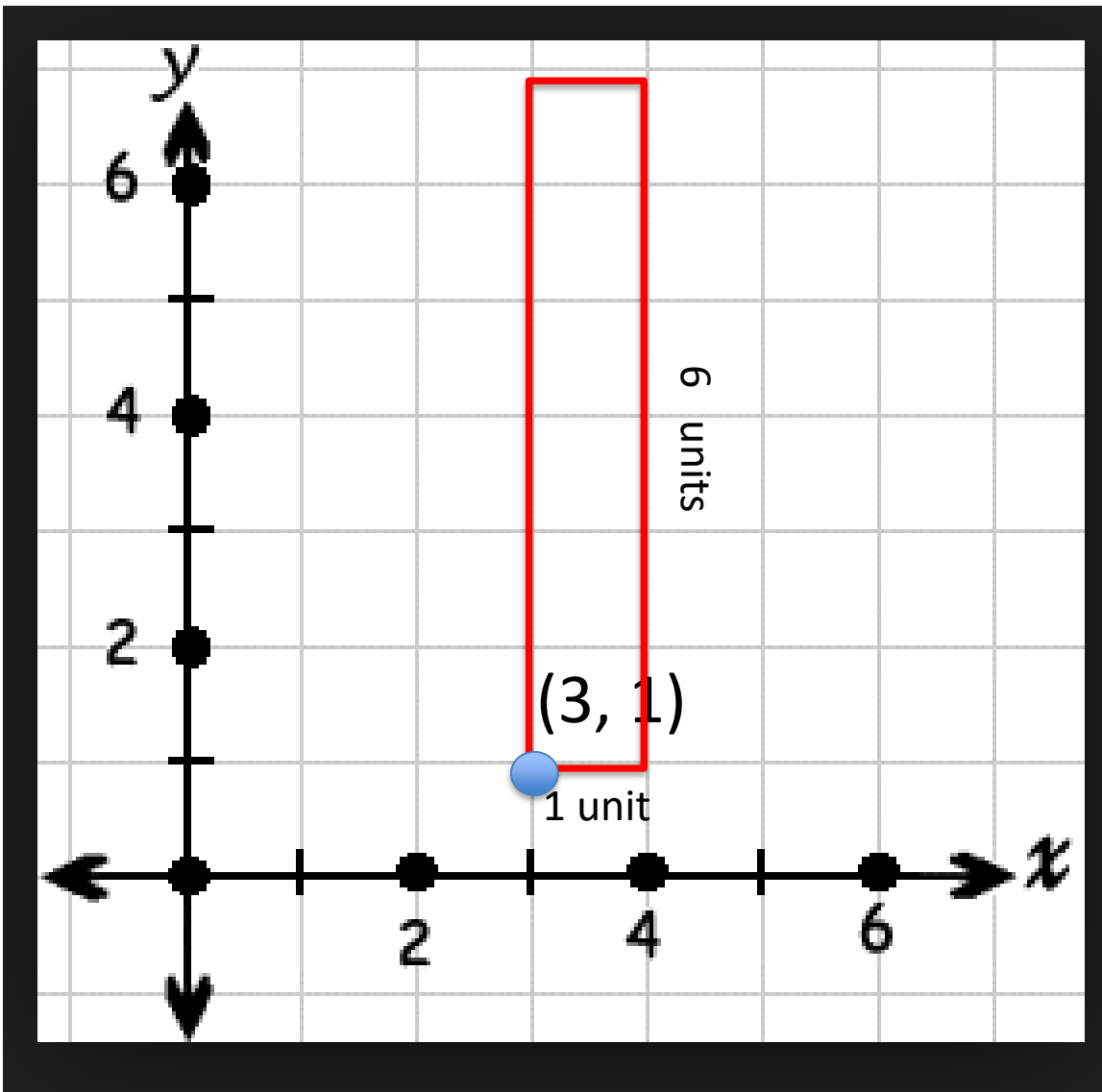


Area = Length X Width

$$A = 3u \times 2u$$

$$A = 6 \text{ Square Units}$$

$$A = 6 u^2$$



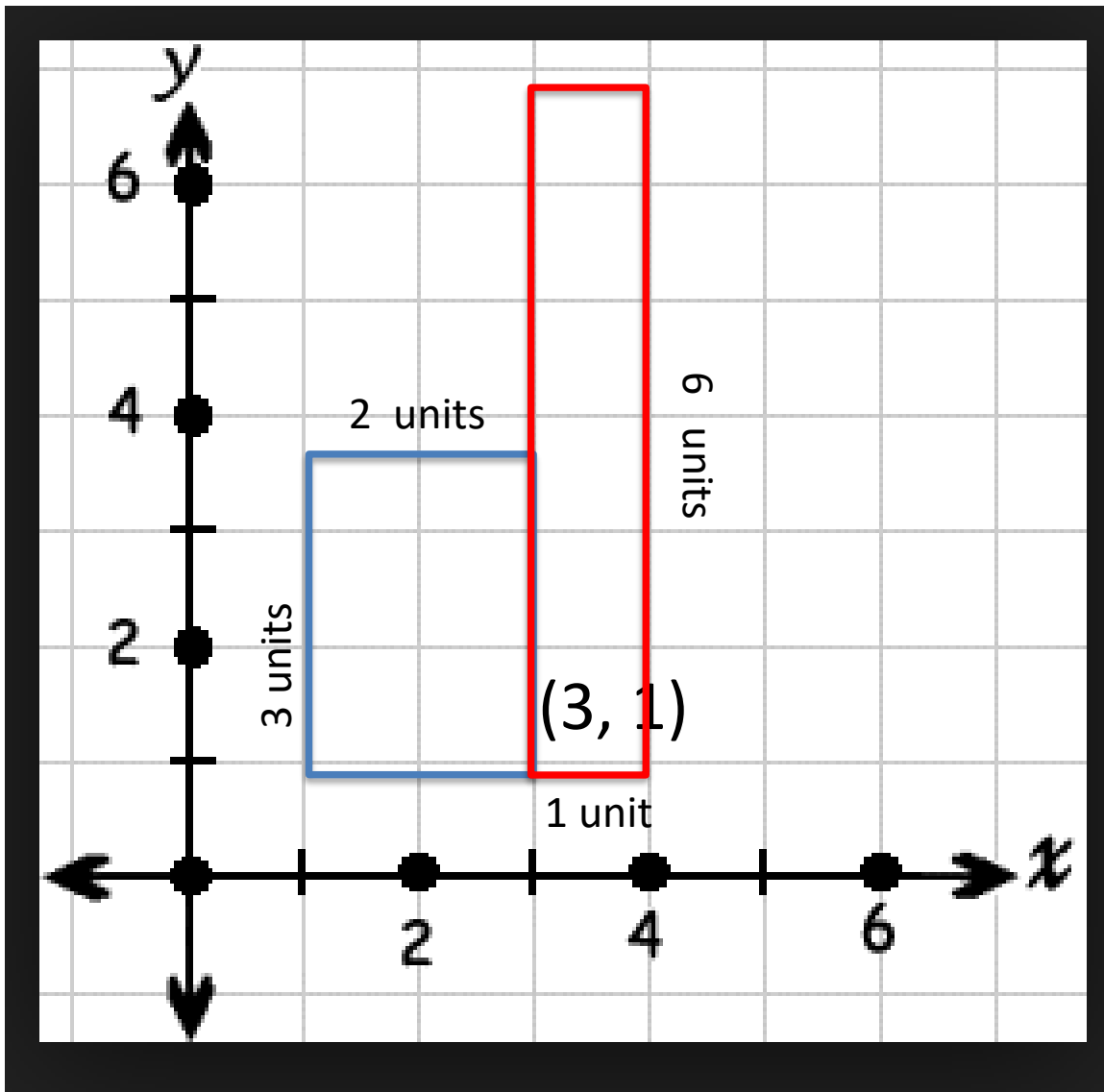
Another solution

Area = Length X Width

$$A = 6u \times 1u$$

A = 6 Square Units

$$A = 6 u^2$$



The red rectangle has more perimeter!

Which
 quadrilateral
 has more
 perimeter? Show
 your thinking

Blue Rectangle

$$P = (2 \times l) + (2 \times w)$$

$$P = (2 \times 3) + 2 \times (2)$$

$$P = 6 + 4$$

$$P = 10 \text{ units}$$

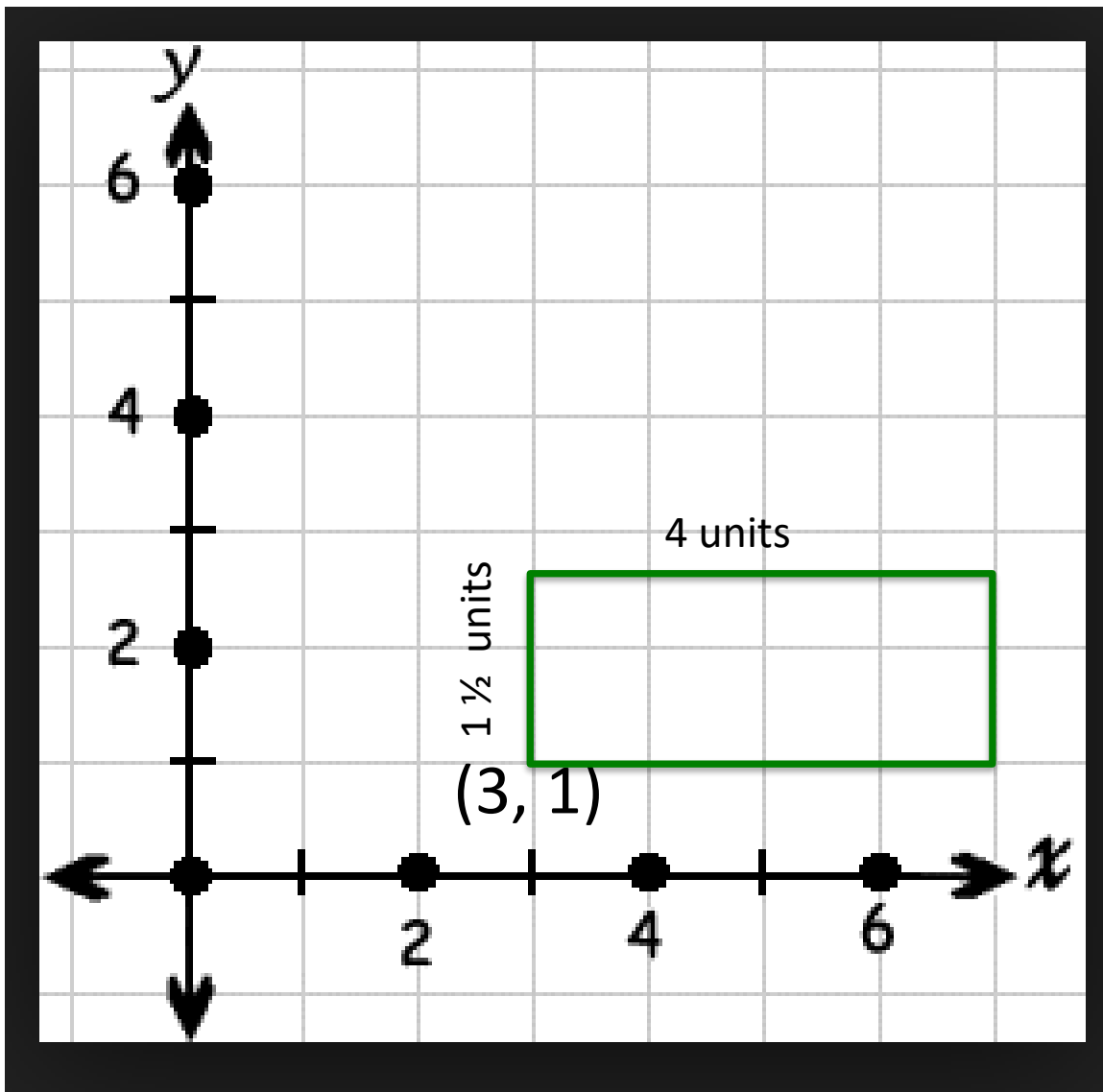
Red Rectangle

$$P = (2 \times l) + (2 \times w)$$

$$P = (2 \times 6) + 2 \times (1)$$

$$P = 12 + 2$$

$$P = 14 \text{ units}$$



Consider this
rectangle.

Does it have an
area of 6
square units?

Area = Length X Width

$$A = 4u \times 1 \frac{1}{2} u$$

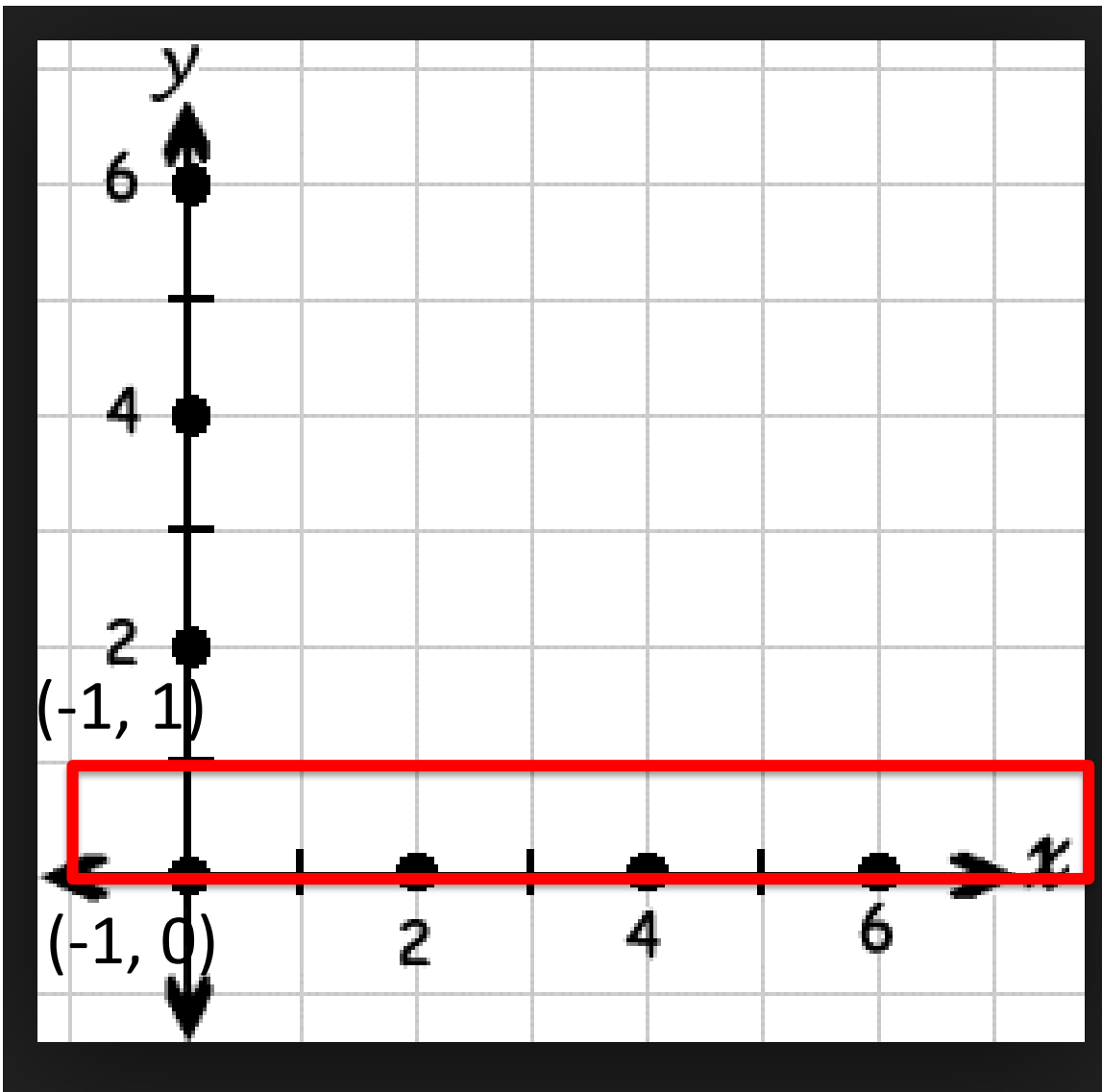
$$A = 4 \times (1 + \frac{1}{2})$$

$$A = (4u \times 1u) + (4u \times \frac{1}{2}u)$$

$$A = 4 u^2 + 2u^2$$

$$A = 6 \text{ Square Units}$$

$$A = 6 u^2$$



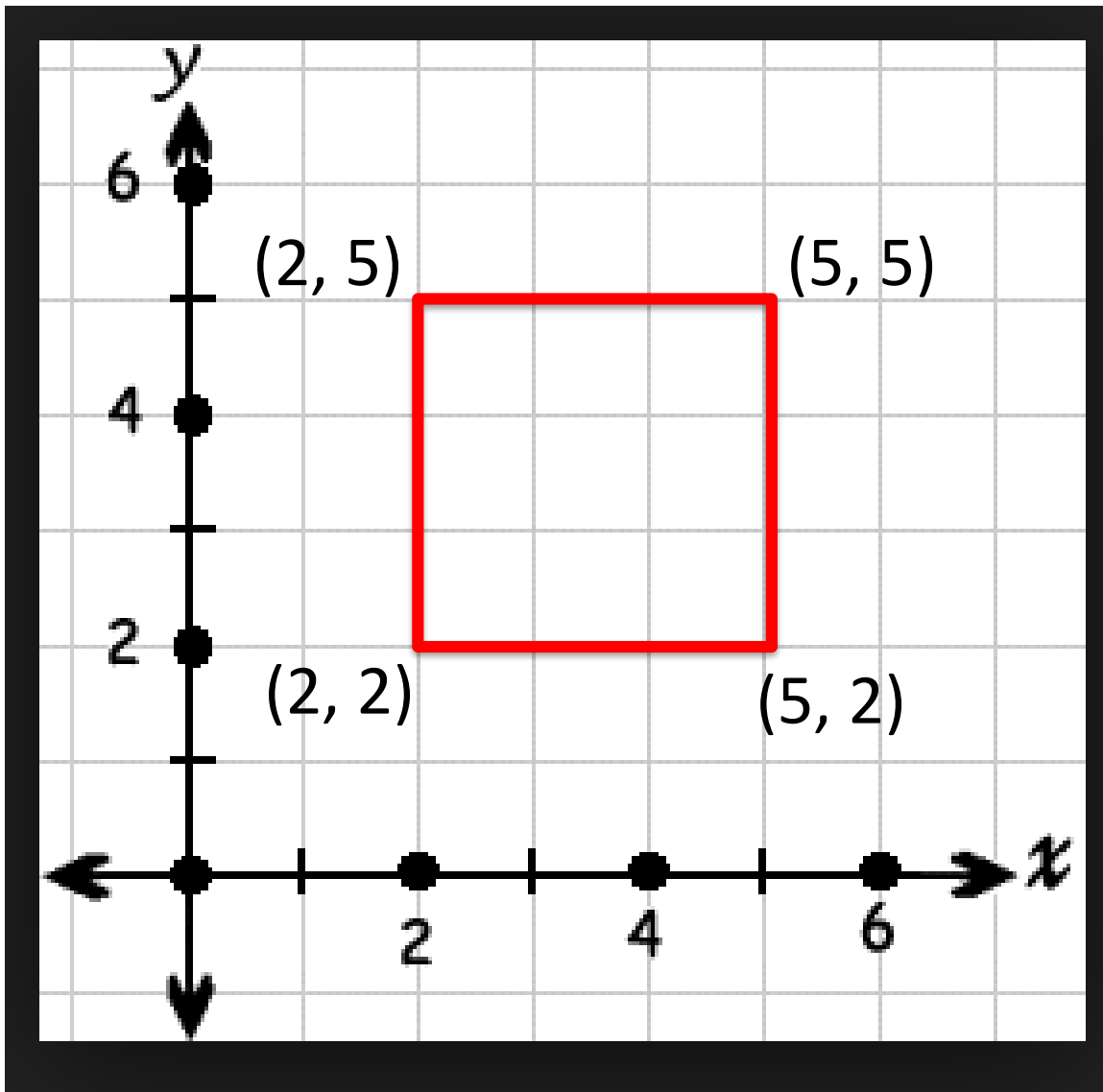
Draw a **rectangle** with an area of 9. **Label** the **corners** with ordered pairs.

What are the dimensions?

9u. by 1u.

(8, 1)

(8, 0)



Another
solution!

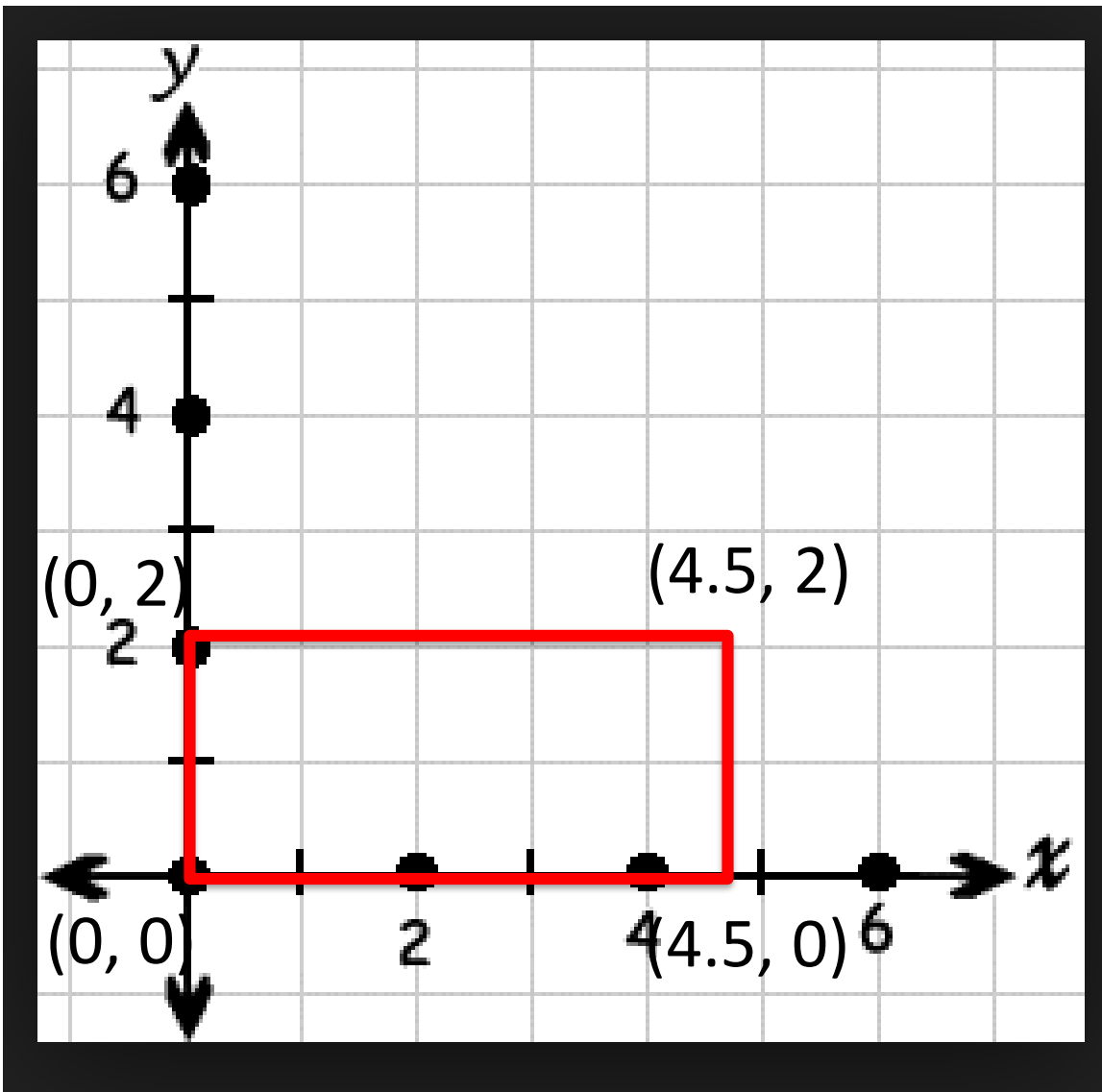
What are the
dimensions?

3u. by 3u.

Is this shape a
rectangle?

Explain.

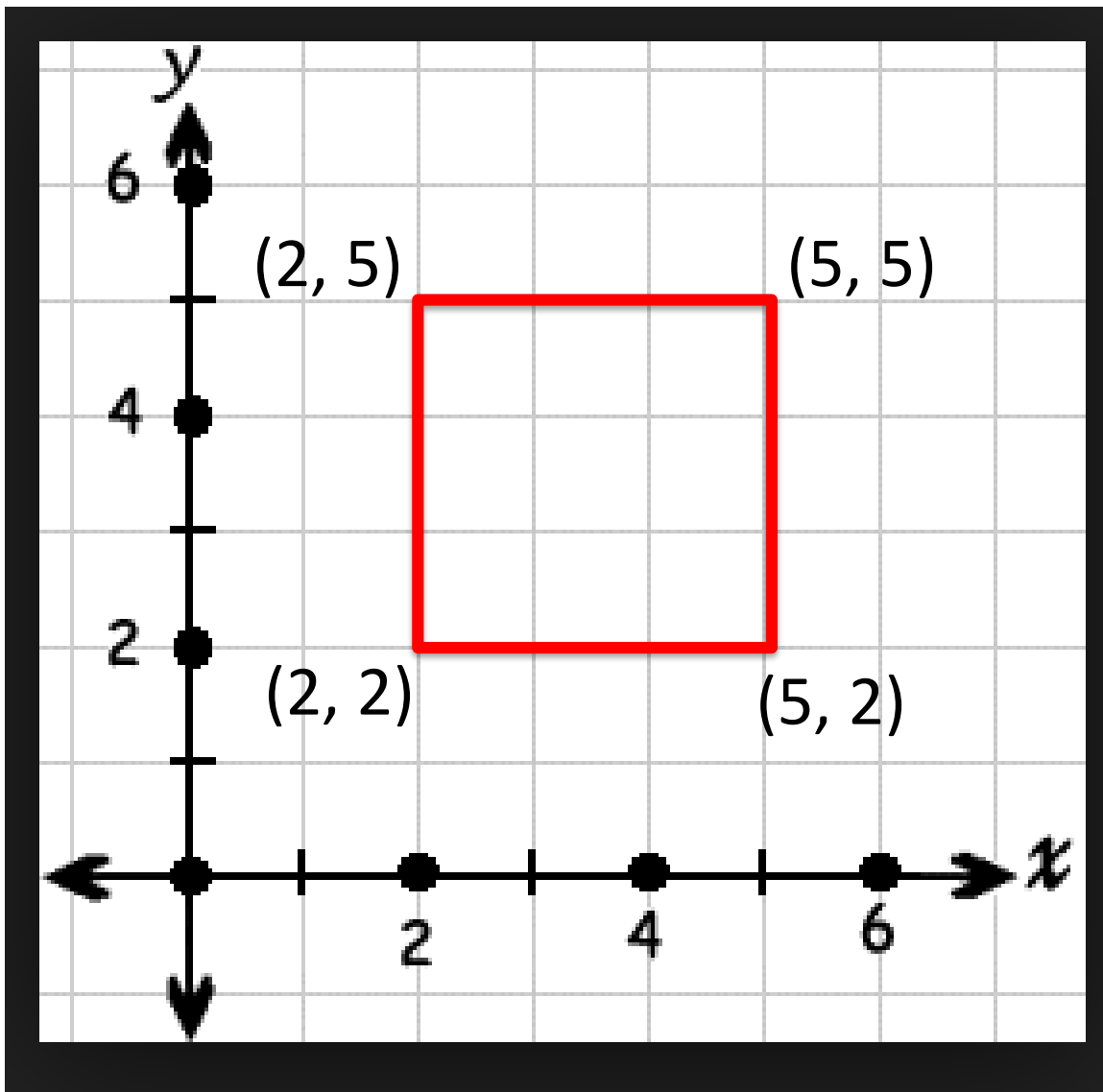
Yes, it is a parallelogram with right angles! All squares are a kind of rectangle!
(It's a quadrilateral with opposite sides parallel and has right angles... it's also a **rhombus** because all sides are congruent!)



Another
solution

What are the
dimensions?

2u. by 4.5 u.

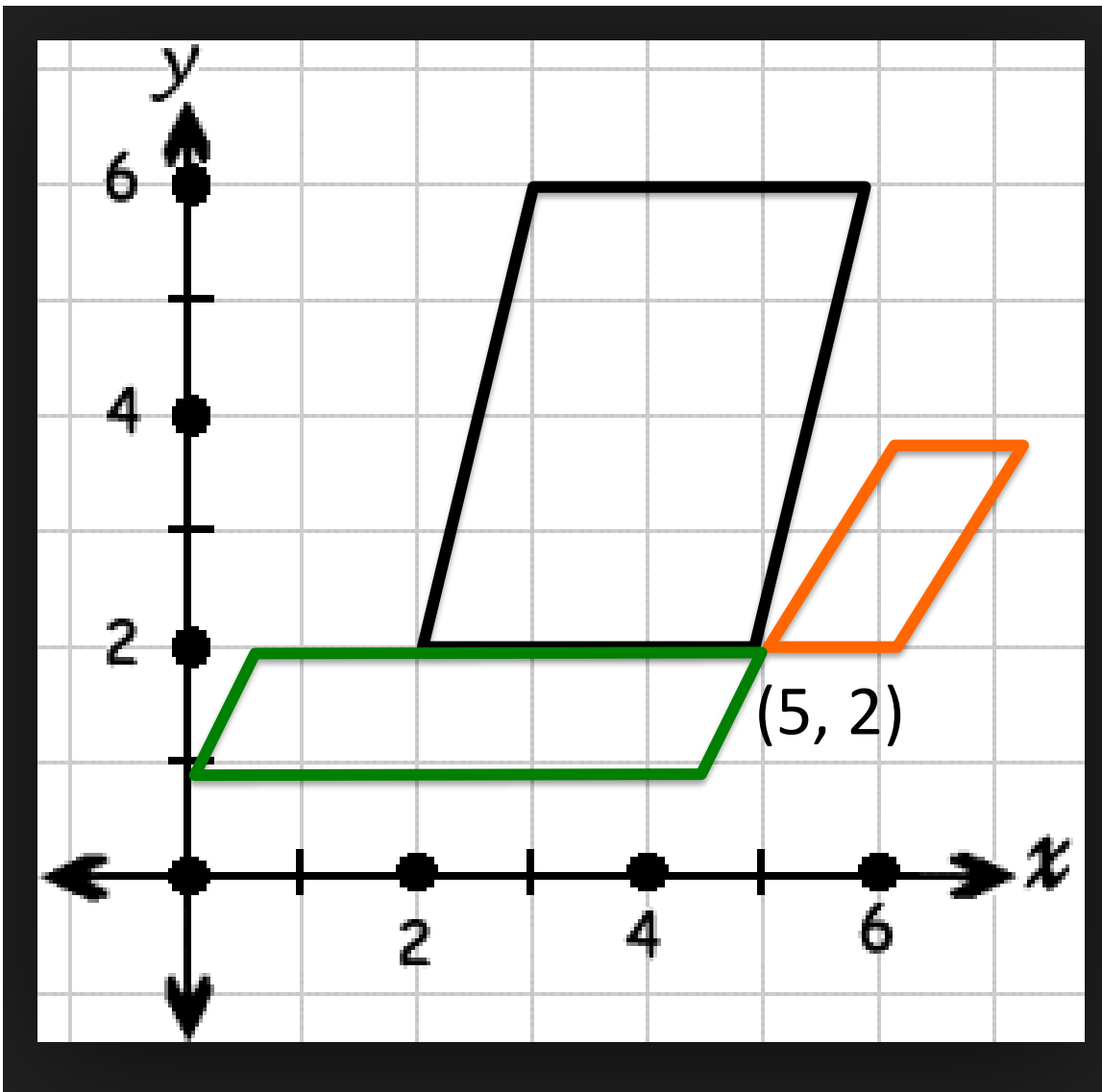


Calculate the **perimeter** of this square. **Show** your work.

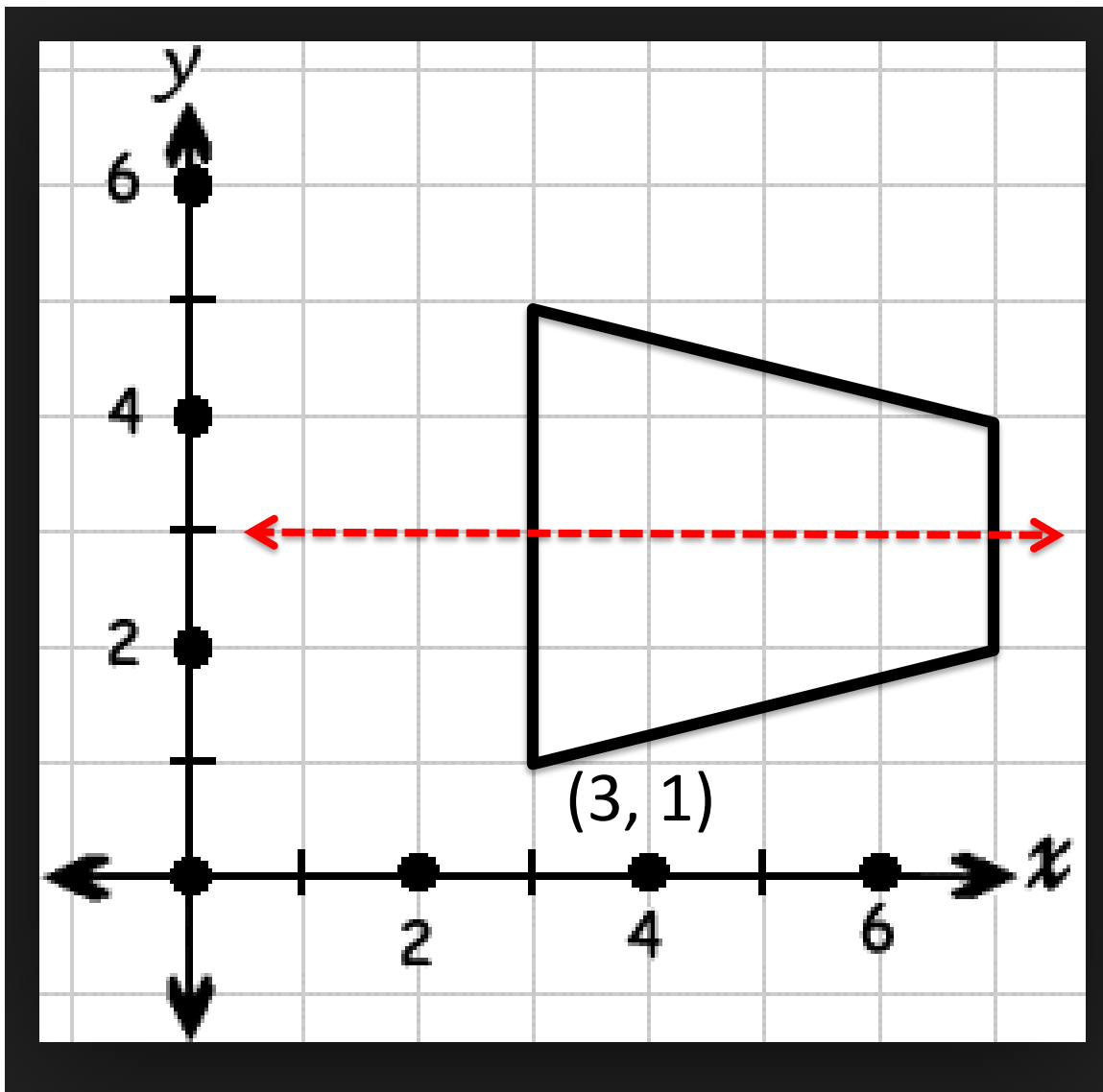
$$P = S + S + S + S$$

$$P = 3 + 3 + 3 + 3$$

$$P = 12 \text{ UNITS}$$



Draw a
parallelogram
with a vertex
at $(5, 2)$ with
no right
angles.



Draw an isosceles trapezoid with a vertex at $(3, 1)$

Include a dotted line of symmetry in your drawing.

Teachers:

After the Powerpoint, print out the next slide. Students can try and solve the riddles on the next page. The answers follow.

Coordinate Shape Puzzles: Draw your answers on the graph paper.

1. I am a rectangle.

I have an area of 12 square centimeters.

One vertex is at the point (2, 2).

There is a vertical line of symmetry that goes through the points (4, 3) and (4, 4).

The rectangle is in the first quadrant.

Draw this rectangle with the line of symmetry and label the vertices.

What is the perimeter? Write it under the shape. (P = _____)

2. I am an isosceles trapezoid.

Two of my vertices are at (5, 6) and (5, 8). The other two vertices are at (7, 4) and (7, 10).

Draw this polygon.

What is the area? Write the area inside the shape (A = _____), and show how you know you are correct.

3. I am a rhombus with right angles.

I have an area of 9 square centimeters.

My center point is (2.5, 7.5).

Draw this quadrilateral and the diagonals. Label the vertices.

4. I am a parallelogram with no right angles.

Three vertices are (8, 2) (8, 8) and (10, 10).

Draw this quadrilateral. Label the missing vertex.

What is the area? Write the area next to the shape (A = _____), and show how you know you are correct.

Estimate the perimeter. Write the perimeter next to the shape (P = _____). [= means approximately]

Finished? Check your answers, then make up one of your own puzzles. Make sure it is solvable!

Solving Coordinate Puzzles. Draw and label your shapes here.

Name ANSWER KEY

