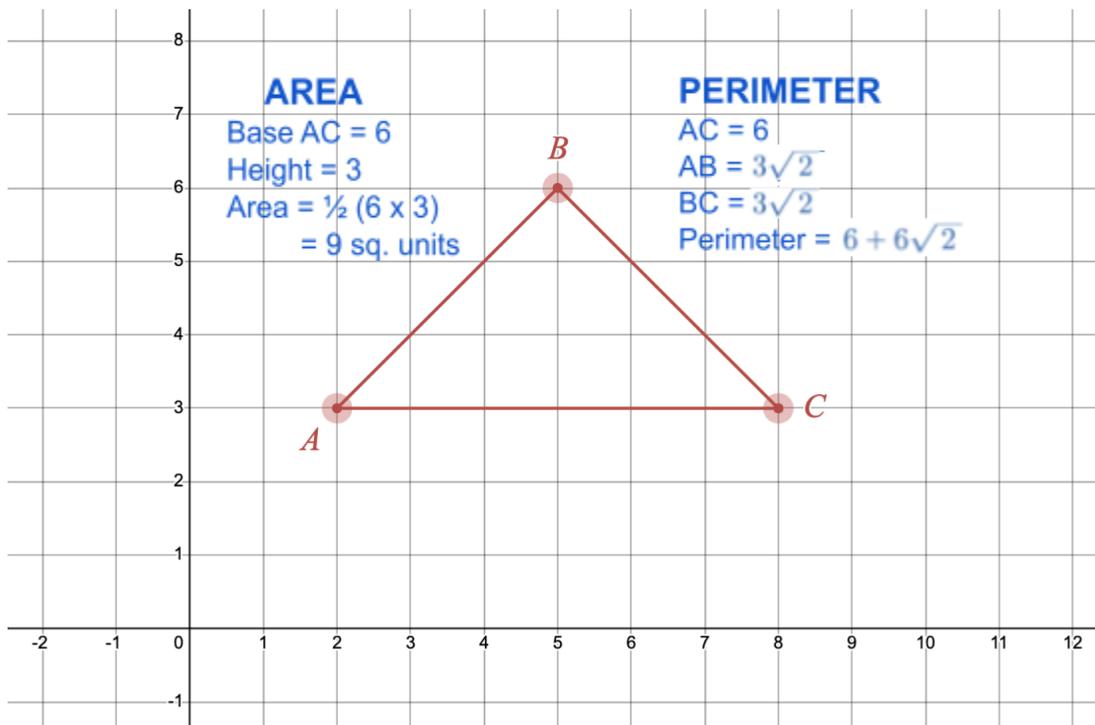


## M154: Coordinate Geometry Post-Badge Task

### Reflecting on Badge Learning

Now that you have learned more about coordinate geometry, respond to the questions that follow. These are the same questions you responded to before the start of this badge.

**QUESTION 1** Determine the area and perimeter of Triangle ABC. Show the calculations that support your answers.

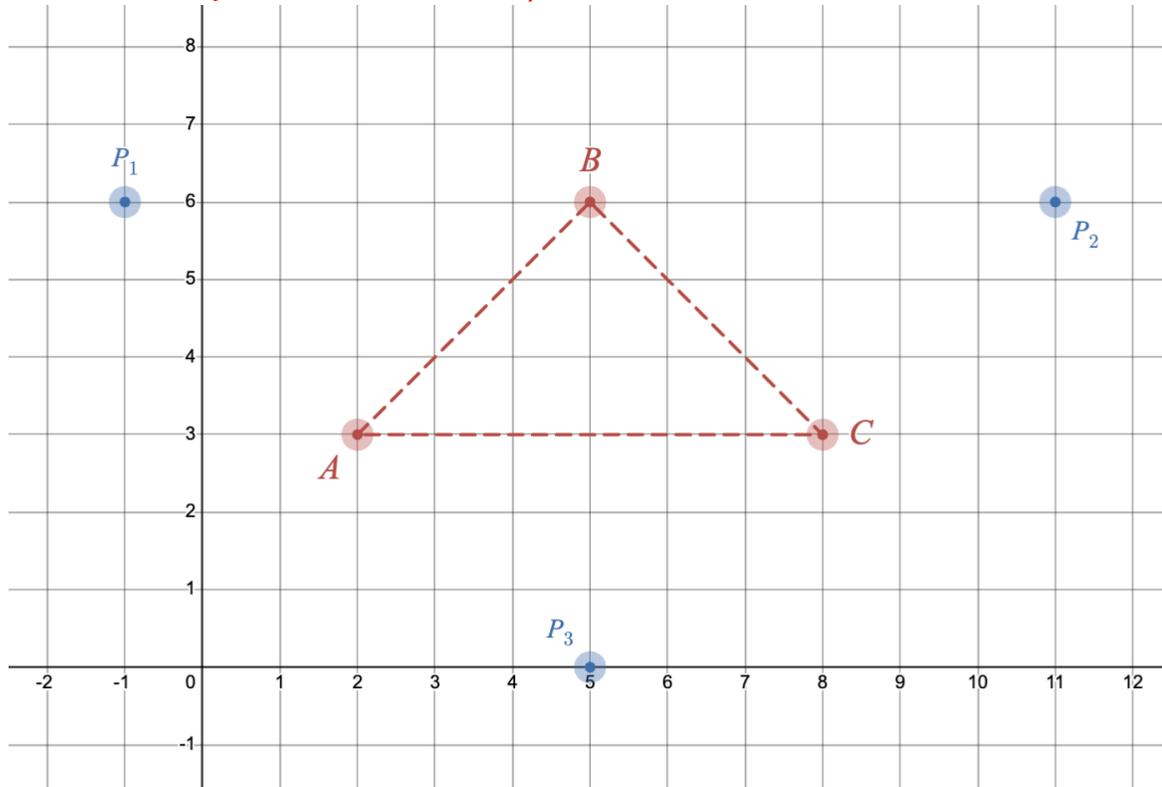


## Teacher Scoring Guide

**QUESTION 2** Where could you place Point P so that together with Points A, B, and C the resulting figure is a parallelogram?



*Answers will vary. Possible student responses:*



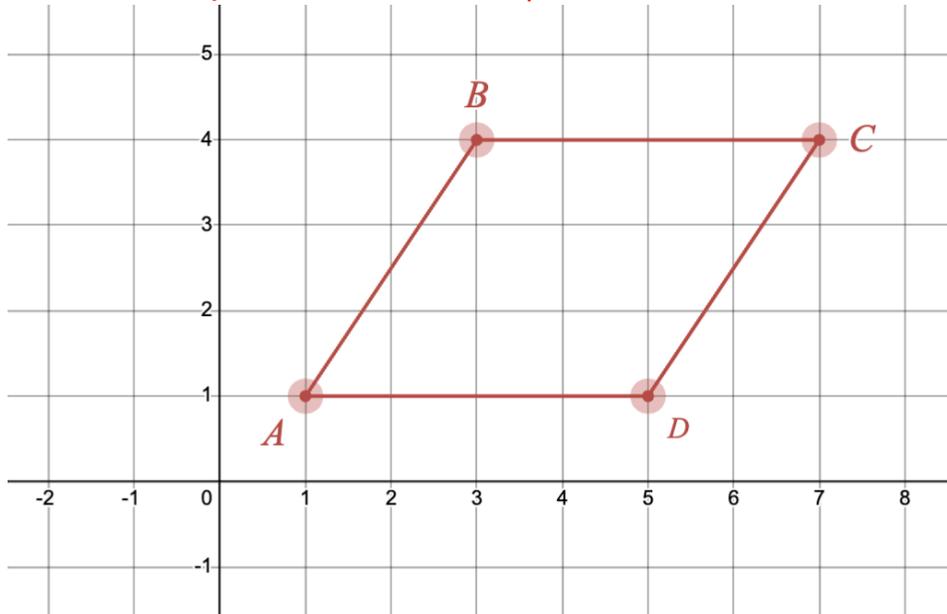
There are three possible locations for Point P. Here, they are denoted P<sub>1</sub>, P<sub>2</sub>, and P<sub>3</sub>.

## Teacher Scoring Guide

**QUESTION 3** Amber and Nolan are discussing the figure below. Amber says that figure ABCD is a rhombus. Nolan believes it is not a rhombus. Choose whether you will take the perspective of Amber or Nolan. If you choose to be Amber, you will explain to Nolan why you are certain that the figure is a rhombus. If you choose to be Nolan, you will help Amber understand why the figure is not a rhombus. Have fun!



*Answers will vary. Possible student response:*



Hi, my name is Nolan.

Slope of BC = Slope of AD = 0 **AND**

Slope of AB = Slope of CD =  $\frac{3}{2}$ .

Therefore, Figure ABCD has the property that opposite sides are parallel.

**This means that Figure ABCD is a parallelogram.**

I calculated the following lengths:

$AB = CD = \sqrt{13}$  units.

$BC = AD = 4$  units.

Therefore, Figure ABCD does not have four equal sides.

**So I know Figure ABCD is NOT a rhombus.**

None of the angles are right angles.

**Figure ABCD is NOT a rectangle.**

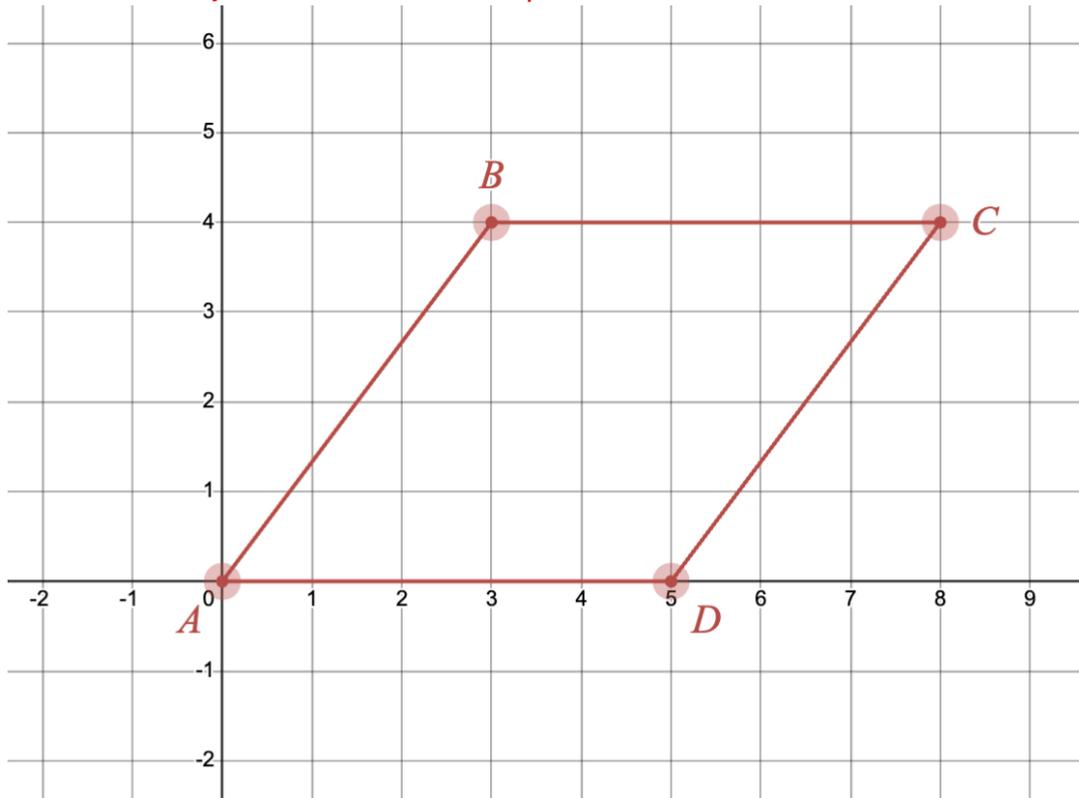
**Figure ABCD CANNOT be a square since its sides aren't all equal and its angles are not right angles.**

## Teacher Scoring Guide

**QUESTION 4** Figure ABCD is defined by the points A(0,0), B(3,4), C(8,4), and D(5,0). Which labels—parallelogram, rectangle, rhombus, square—apply to figure ABCD? Give a coordinate proof to support your claim.



*Answers will vary. Possible student response:*



$$BC = AD = 5 \text{ units}$$

$$AB = DC = \sqrt{3^2 + 4^2} = 5 \text{ units}$$

Since both pairs of opposite sides are congruent, **Figure ABCD is a parallelogram.**

Since all four sides are congruent, **Figure ABCD is a rhombus.**

Since there are no right angles, **Figure ABCD is neither a rectangle nor a square.**

## Teacher Scoring Guide

**QUESTION 5** What else did you learn that was not reflected in Questions 1-4?



*Answers will vary. Possible student response:*

- I also learned a pattern for figuring out the coordinates when a shape is rotated 90 degrees around the origin. If the coordinates of some point are like (5,3), the image point will have coordinates (-3,5).

**QUESTION 6** Compare your answers to these questions now to your answers from the earlier attempt. What do you notice about your progress?



*Answers will vary. Look for students to explain what they know now compared to what they knew when responding to the pre-test.*