

Name:

Date:

Period: 3

Coordinate Proofs

Lesson Objective: INBAT place figure in the coordinate plane and write coordinate proofs

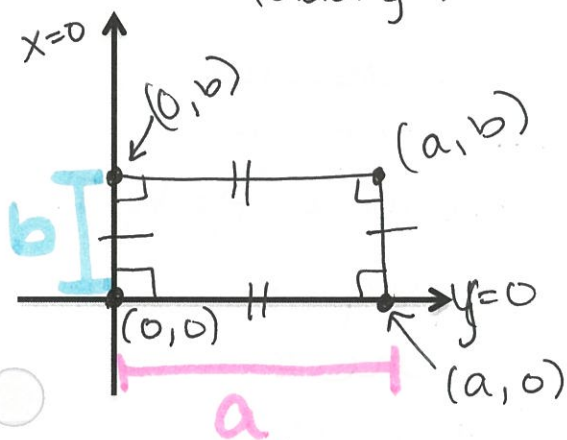
Coordinate Proof: A coordinate proof involves placing a geometric figure in a coordinate plane.

→ When you use variables to represent the coordinates of a figure in a coordinate proof, the results are true for ALL figures of that type.

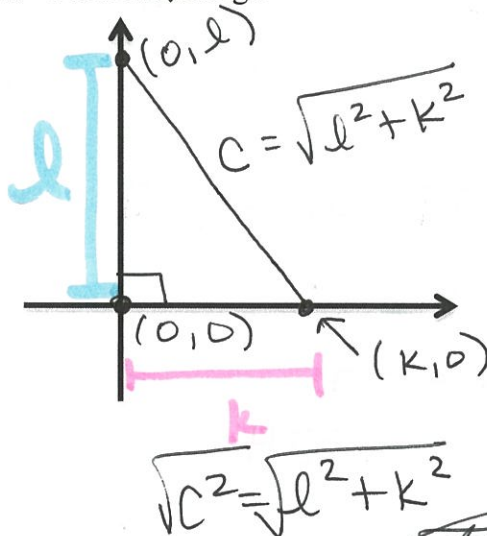
Placing Figures in the Coordinate Plane

Examples:

1. a rectangle (oblong rectangle)



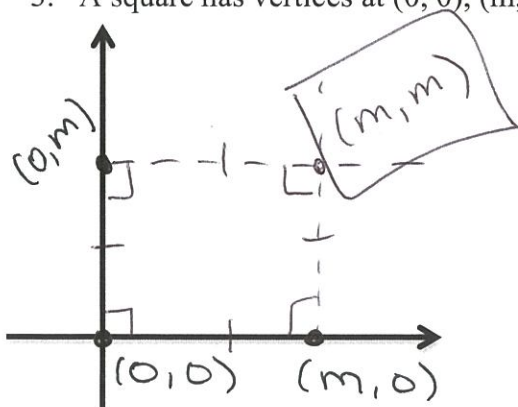
2. a scalene triangle



$$\sqrt{c^2} = \sqrt{l^2 + k^2}$$

$$\sqrt{l^2 + k^2} = \sqrt{l^2 + k^2}$$

3. A square has vertices at $(0, 0)$, $(m, 0)$, and $(0, m)$. What are the coordinates of the fourth vertex?

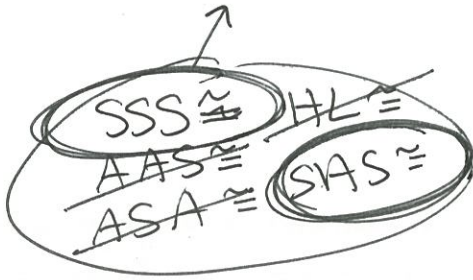
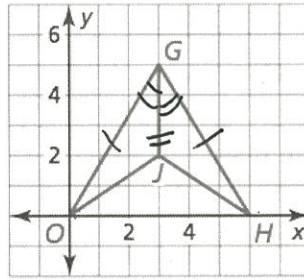


Writing a Proof Using Coordinate Geometry

5. Write a two-column proof.

Given: $\overline{GJ}$ bisects $\angle OGH$

Prove: $\triangle GJO \cong \triangle GJH$



$$OG = \sqrt{(0-3)^2 + (0-5)^2}$$

$$OG = \sqrt{(-3)^2 + (-5)^2}$$

$$OG = \sqrt{9+25}$$

$$OG = \sqrt{34}$$

$$HG = \sqrt{(6-3)^2 + (0-5)^2}$$

$$HG = \sqrt{(3)^2 + (-5)^2}$$

$$HG = \sqrt{9+25}$$

$$HG = \sqrt{34}$$

Statements

Reasons

① $\overline{GJ}$ bisects $\angle OGH$

② $\angle OGJ \cong \angle HGJ$

③ $\overline{GJ} \cong \overline{GJ}$

④ $OG = \sqrt{34}, HG = \sqrt{34}$

⑤ $OG = HG$

⑥ $\overline{OG} \cong \overline{HG}$

⑦ $\triangle GJO \cong \triangle GJH$

① given

② def. of $\angle$ bisector

③ reflex. prop. $\cong$

④ dist. formula (Pyth. Thm)

⑤ Trans. prop. =

⑥ = segs. are $\cong$

⑦ SAS $\cong$ (3, 2, 6)

6. How could we prove that $\angle O \cong \angle H$ from the figure above?

CPCATC