

Geometry Lesson 57

Objective: TSW find perimeter and area with coordinates.

Date: _____

Period: _____

When a figure is on a coordinate plane and no measurements are given, the distance formula can be used to determine the measurements necessary to find the area or perimeter of the figure.

Example 1 Finding Perimeter with Coordinates

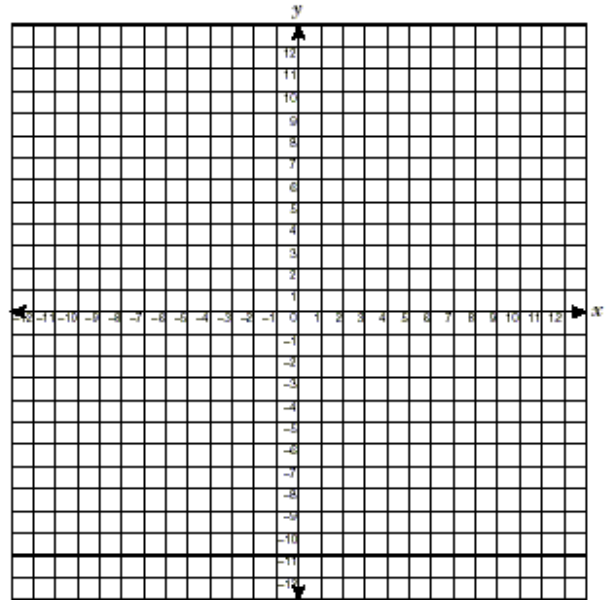
Find the perimeter of the rectangle with coordinates $A(2, 4)$, $B(2, -2)$, $C(3, -2)$ and $D(3, 4)$.

SOLUTION

Hint

The distance formula for finding the distance between points (x_1, y_1) and (x_2, y_2) is: $d =$

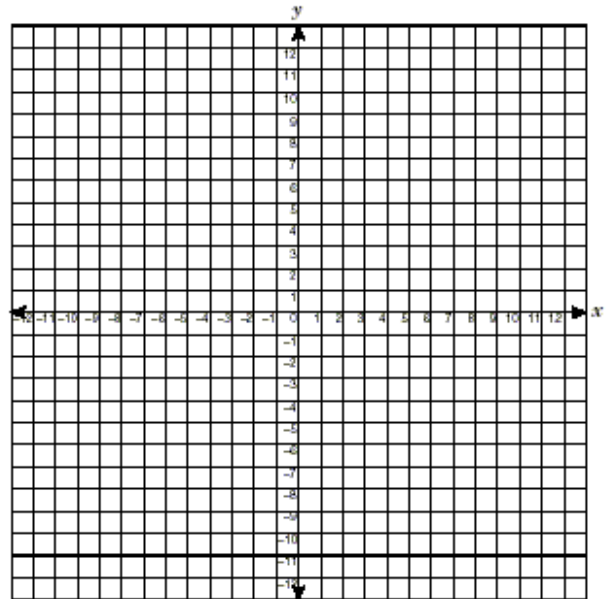
$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



Example 2 Finding Perimeter with the Distance Formula

Find the perimeter of rectangle $EFGH$ with coordinates $E(1, 3)$, $F(2, 0)$, $G(-4, -2)$, and $H(-5, 1)$. Give your answer in simplified radical form.

SOLUTION



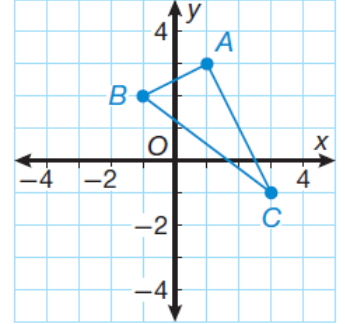
Area can be found on a coordinate plane in the same way. It is important to know what kind of polygon a figure is before attempting to find its area.

Though a figure may look like a rectangle, you cannot assume it is unless you are given that information in the problem or you can prove that the adjacent sides of the figure are perpendicular to each other.

Example 3 Calculating Area with Coordinates

Find the area of right triangle ABC with right angle $\angle BAC$.

SOLUTION

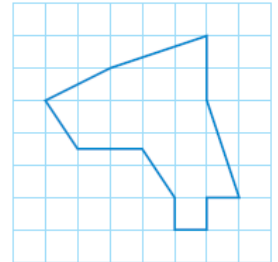


Sometimes it may be necessary to find the area of an irregular polygon. A coordinate plane makes this possible, because each square on the grid can be counted and added together to find the area of a figure. When a square is not entirely inside a polygon, it may be necessary to estimate and obtain an approximate area.

Example 4 Estimating Area with Coordinates

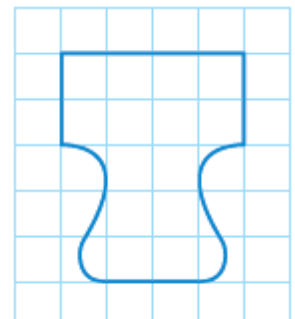
a. Estimate the area of the polygon.

SOLUTION



b. Estimate the area of the figure.

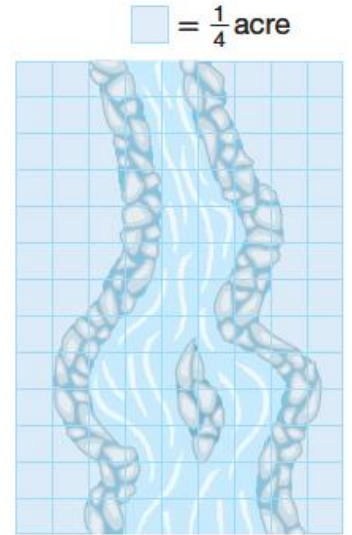
SOLUTION



Example 5 Application: Farming

A farmer wants to estimate how much seed she needs to buy for her land. She cannot farm in the river or on the riverbank, which is shaded in the diagram. For every acre, she needs 2 bags of seed. Estimate how many bags of seed she will need. Each square unit on the grid represents one fourth of an acre.

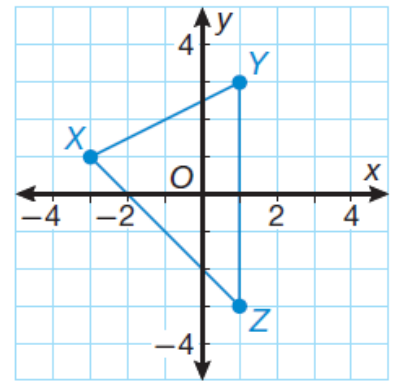
SOLUTION



You Try!!!!

a. Find the perimeter of rectangle $LMNO$ with coordinates $L(-5, 3)$, $M(-5, -1)$, $N(4, -1)$, and $O(4, 3)$.

c. Calculate the area of $\triangle XYZ$.



d. Estimate the area of the figure.

