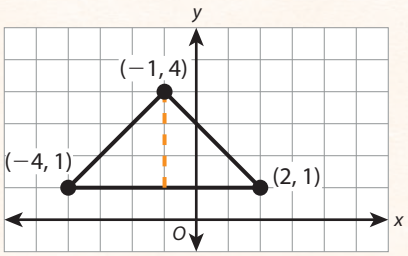
Dear Family,

Your child is learning about polygons in the coordinate plane.

Polygons, such as triangles and rectangles, can be shown on the coordinate plane.



The triangle on the coordinate plane at the right has vertices, or corners, at the points (−1, 4), (2, 1), and (−4, 1). To find the area of the triangle, you can use the formula $A = \frac{1}{2}bh$.

First you need to find the length of the base, b, and the height, h, of the triangle. You can count units on the coordinate plane to find the lengths.

Count units along the base of the triangle. The base, b, is 6 units. Count units from the base to the top vertex. The height, h, is 3 units. Now you can use the formula to find area of the triangle.

$$A = \frac{1}{2}bh$$

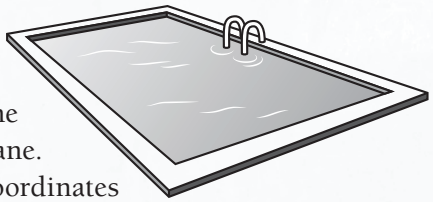
$$= \frac{1}{2}(6)(3)$$

$$= 9$$

The area of the triangle is 9 square units.

Consider the following example:

A swim club plans to replace the decorative edging around a rectangular pool. A diagram of the pool is drawn on a coordinate plane. Three corners of the pool have coordinates at (3, 4), (3, −5), and (−1, −5). Find the coordinates of the fourth corner and the perimeter of the pool.



On the next page you will see how your child can find the coordinates of the fourth corner and two ways your child may find the perimeter of the pool.

NEXT

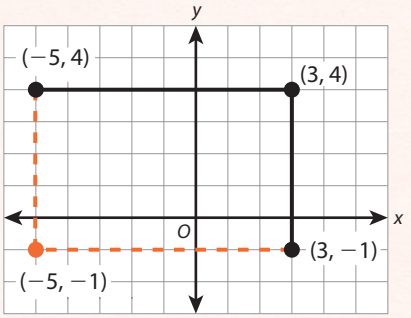
©Curriculum Associates, LLC Copying is not permitted.

Polygons in the Coordinate Plane: Sample Solution

A diagram of a rectangular pool drawn on a coordinate plane has coordinates (3, 4), (−5, 4), and (3, −1) for three of its corners. Find the coordinates of the fourth corner and the perimeter of the pool.

To find the fourth corner of the pool, draw a horizontal line that goes through (3, −1) and a vertical line that goes through (−5, 4). The fourth corner is at (−5, −1).

To find the perimeter of the pool, find its length and width.



One way: Find length and width by counting units.

To find the length, count the units from (−5, 4) to (3, 4): 8 units.

To find the width, count the units from (3, 4) to (3, −1): 5 units.

The perimeter is 5 + 8 + 5 + 8, or 26 units.

Another way: Find length and width using absolute value.

- To find the length, find the distance from (−5, 4) to (3, 4). The points have the same y-coordinate, so find their distances from the y-axis. Then add the distances.
  The distance from (−5, 4) to the y-axis is $|-5|$.
  The distance from (3, 4) to the y-axis is $|3|$.
  $|-5| + |3| = 5 + 3 = 8$
- To find the width, find the distance from (3, 4) to (3, −1). The points have the same x-coordinate, so find their distances from the x-axis. Then add the distances.
  The distance from (3, 4) to the x-axis is $|4|$.
  The distance from (3, −1) to the x-axis is $|-1|$.
  $|4| + |-1| = 4 + 1 = 5$

The perimeter is $2\ell + 2w$: $2(8) + 2(5) = 16 + 10 = 26$ units

Answer: The fourth corner of the pool is located at (−5, −1). Both methods show that the perimeter of the pool is 26 units.

©Curriculum Associates, LLC Copying is not permitted.