

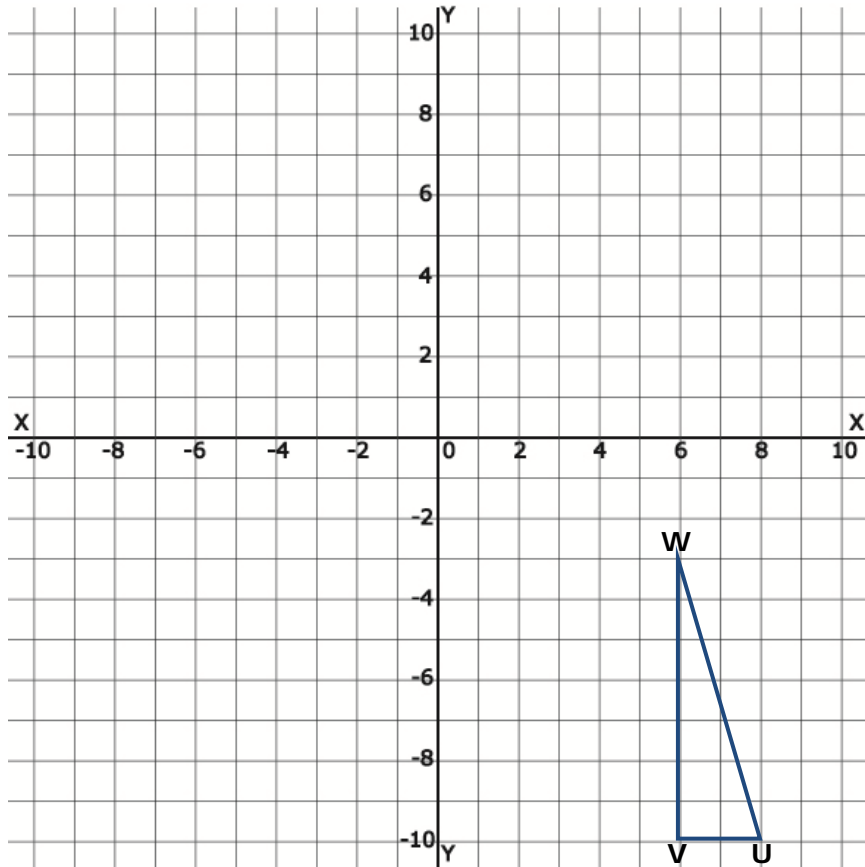
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## Area and Perimeter in the Coordinate Plane - Step-by-Step Lesson

Use the model to complete the multiplication sentence

What is the area of  $\triangle UVW$



### Explanation:

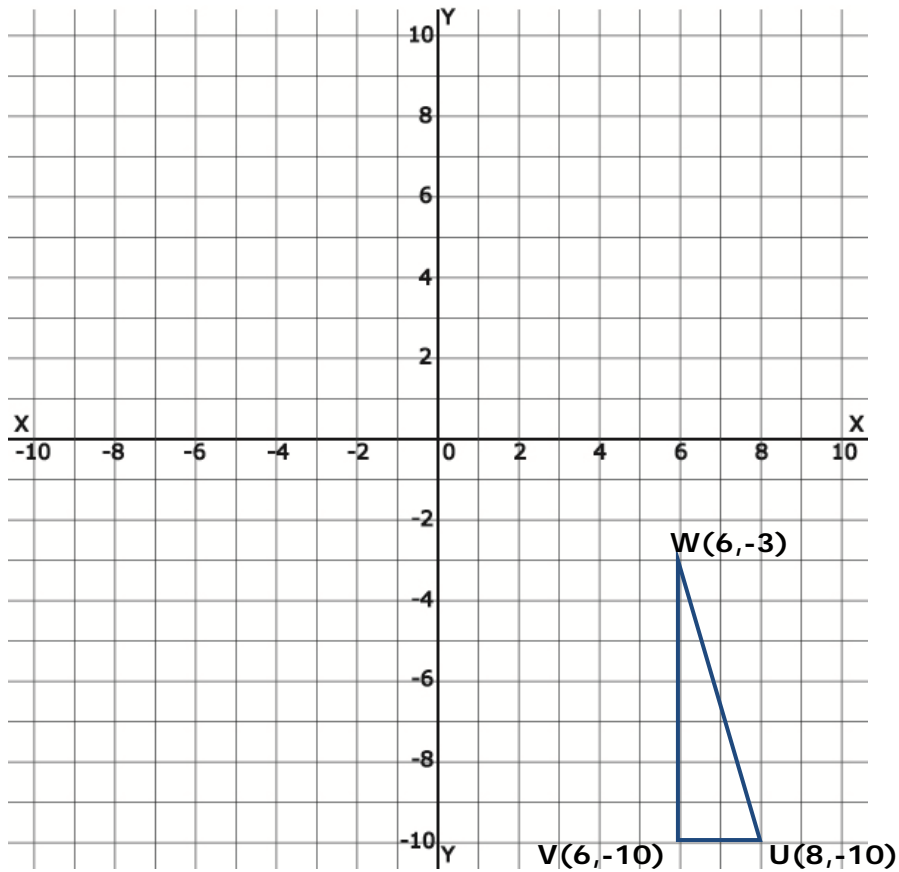
Step 1) Area of a triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

Identify the coordinates of all points.



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To find the area of  $\triangle UVW$ , first find its base and height. Then, use the formula for the area of a triangle.

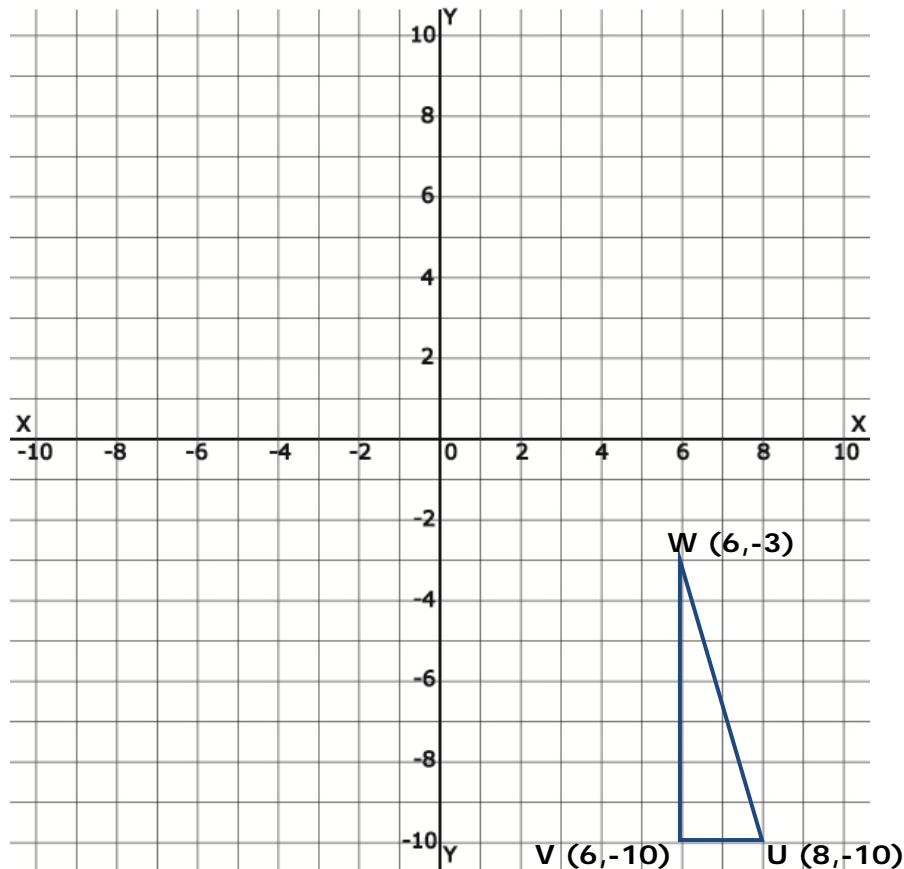
Step 2: Find the base.

Any side of the triangle can be the base, but  $\overline{UV}$  is the best choice. Since U (8, -10) and V (6, -10) have the same y-coordinate,  $\overleftrightarrow{UV}$  is a horizontal line. So, it is straightforward to calculate UV.



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UV is the absolute value of the difference in the x-coordinates of U(8,-10) and V(6,-10). So,  $UV = (8-6) = 2$ .

Step 3) Find the height.

The height of  $\triangle UVW$  is the length of the altitude between W (6,-3) and  $\overleftrightarrow{UV}$ .

Since W (6,-3) and V (6,-10) have the same x-coordinate, the altitude lies on the vertical line,  $\overleftrightarrow{VW}$ . So, the height is just  $VW = (-10--3) = 7$ .

Step 4) Finally, plug the values of the base and height into the formula for the area of a triangle.

$$\text{Area of a triangle} = \frac{1}{2} \cdot b \cdot h$$

$$= \frac{1}{2}(2)(7) \quad \text{Plug in } b=2 \text{ and } h=7$$

$$= \frac{14}{2} \quad \text{Multiply}$$

$$= 7 \quad \text{Simplify}$$

So, the area of  $\triangle UVW$  is 7 square units.

