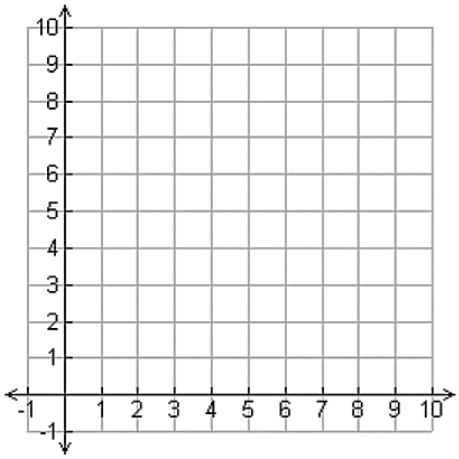
Coordinate proof of a rectangle

Name _____

Use Coordinate Geometry to prove that parallelogram $ABCD$ is a rectangle given the vertices A (1, 3), B (5, 7), C (7, 5) and D (3, 1).



Method 1

Show that consecutive sides are perpendicular which means their slopes are opposite reciprocals. (or product is -1)

Formula for the slope $m = \frac{y_2 - y_1}{x_2 - x_1}$

Calculate the slopes of all the sides.

$m_{\overline{AB}} =$ $m_{\overline{BC}} =$

$m_{\overline{CD}} =$ $m_{\overline{DA}} =$

Explain why $ABCD$ is a rectangle:

Method 2

Show that diagonals are congruent which means they have the same length.

Find the lengths of the diagonals.

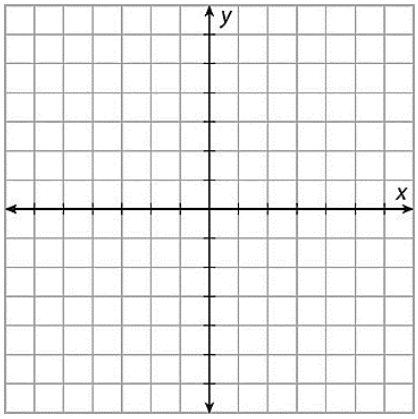
Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ or Pythagorean Theorem $a^2 + b^2 = c^2$

$AC =$

$BD =$

Explain why $ABCD$ is a rectangle:

1. Prove that quadrilateral $A(-6, 2)$ $B(-3, 6)$ $C(5, 0)$ $D(2, -4)$ is a rectangle.



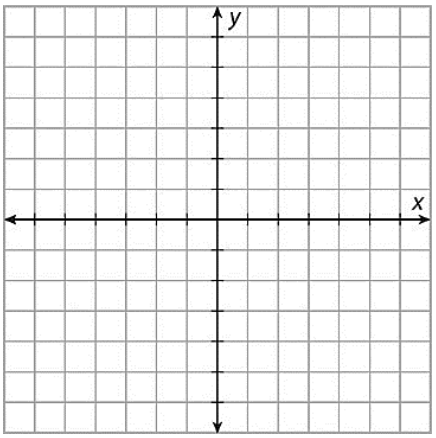
I know $ABCD$ is a parallelogram because_____

_____.

I know $ABCD$ is a rectangle because_____

_____.

2. Prove that quadrilateral $W(-2, 3)$ $X(0, 4)$ $Y(2, 0)$ $Z(0, -1)$ is a rectangle.



I know $WXYZ$ is a parallelogram because_____

_____.

I know $WXYZ$ is a rectangle because_____

_____.