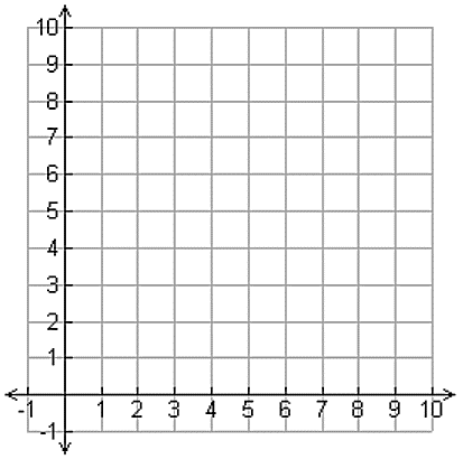
Coordinate proof of a rhombus

Name _____

Use Coordinate Geometry to prove that parallelogram $ABCD$ is a rhombus given the vertices A (2, 2), B (4, 6), C (8, 8) and D (6, 4).



Method 1

Show that diagonals 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 the diagonals.

$m_{\overline{AC}} =$ $m_{\overline{BD}} =$

Explain why $ABCD$ is a rhombus:

Method 2

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

Find the lengths of the sides.

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

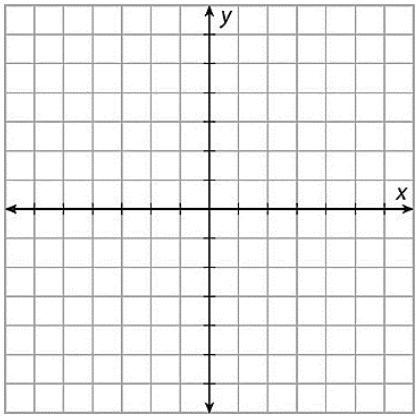
$AB =$ $CD =$

$DA =$

$BC =$

Explain why $ABCD$ is a rhombus:

1. Prove that quadrilateral $A(-3, 2)$ $B(-2, 6)$ $C(2, 7)$ $D(1, 3)$ is a rhombus.



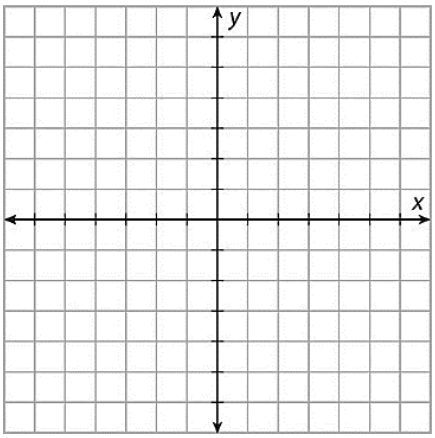
I know $ABCD$ is a parallelogram because_____

_____.

I know $ABCD$ is a rhombus because_____

_____.

2. Prove that quadrilateral $W(-3, 3)$ $X(2, 3)$ $Y(-2, 0)$ $Z(-7, 0)$ is a rhombus.



I know $WXYZ$ is a parallelogram because_____

_____.

I know $WXYZ$ is a rhombus because_____

_____.