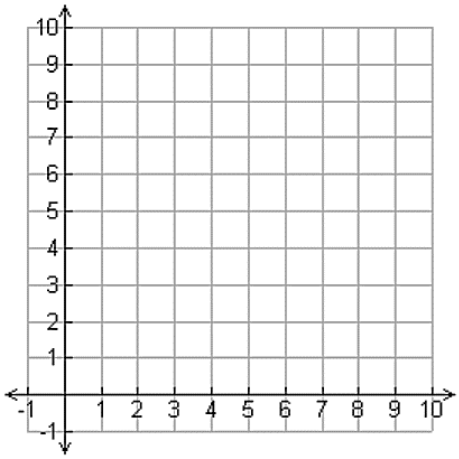
# Coordinate proof of a trapezoid

Name _____

Use Coordinate Geometry to prove that quadrilateral $ABCD$ is a trapezoid given the vertices $A$ (0, 5), $B$ (5, 0), $C$ (7, 4) and $D$ (4, 7).




**Show that exactly one pair of opposite sides is parallel, which means their slopes are the same.**

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 trapezoid:

**Check to see if it is an isosceles trapezoid.**

**Method 1: Show legs are congruent.**

Find the lengths of the legs.

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

$AD =$

$BC =$

**Method 2: Show diagonals are congruent.**

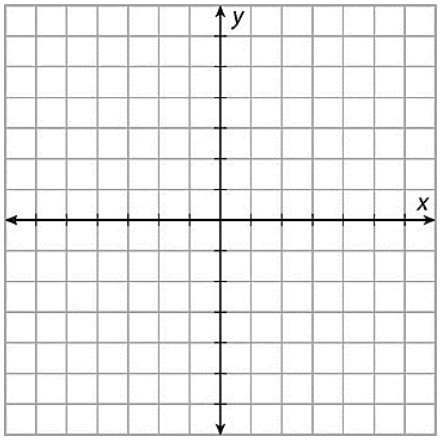
Find the lengths of the diagonals.

$AC =$

$BD =$

Explain why $ABCD$ is a trapezoid:

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



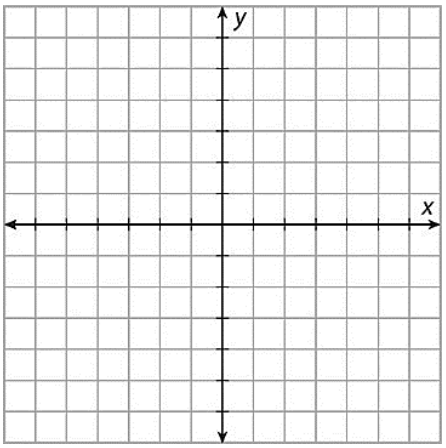

I know $ABCD$ is a trapezoid because_____

_____.

Is $ABCD$ an isosceles trapezoid? Why or why not?_____

_____.

2. Prove that quadrilateral $W(-4, 1)\ X(-1, 4)\ Y(6, 2)\ Z(-1, -5)$ is a trapezoid.




I know $ABCD$ is a trapezoid because_____

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Is $ABCD$ an isosceles trapezoid? Why or why not?_____

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