

Geometry CC – Mr. Valentino

Name: _____

Unit 10 Lesson 8: Proving Trapezoids on the Coordinate Plane

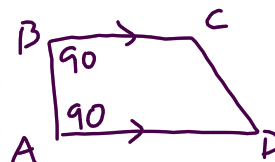
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Proving **TRAPEZOIDS** on the Coordinate Plane!



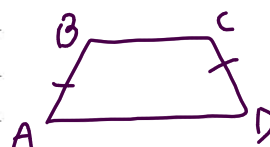
DO NOW: Please list below the 2 properties of a trapezoid:

1. At least one pair of || sides
2. Consecutive \sphericalangle 's as we move from diff. bases are supp.



Super! Now, can you list the properties of an *isosceles trapezoid*?

1. All properties of a trapezoid
2. Legs are \cong (one pair of \cong sides)
3. Base \sphericalangle 's are \cong
4. Diagonals are \cong



Let's jump right into some practice.

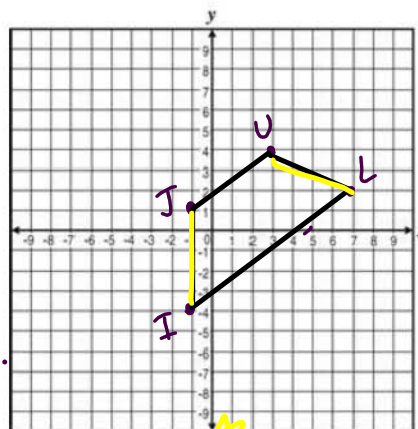
1. The vertices of quadrilateral JULI are J(-1,1), U(3,4), L(7,2), and I(-1,-4).

Prove: JULI is a trapezoid.

JULI is not an isosceles trapezoid.

$$\text{slope } JU = \frac{\Delta y}{\Delta x} = \frac{4-1}{3-(-1)} = \frac{3}{4}$$

$$\text{slope } IL = \frac{\Delta y}{\Delta x} = \frac{-4-2}{-1-7} = \frac{-6}{-8} = \frac{3}{4}$$



$JU \parallel IL$, b/c they have the same slope.
 JULI is a trapezoid b/c it has at least one pair of || sides.

$$JI = \sqrt{(-1-1)^2 + (-4-1)^2} = \sqrt{0^2 + (-5)^2} = \sqrt{0+25} = \sqrt{25} = 5$$

$$UL = \sqrt{(7-3)^2 + (2-4)^2} = \sqrt{4^2 + (-2)^2} = \sqrt{16+4} = \sqrt{20}$$

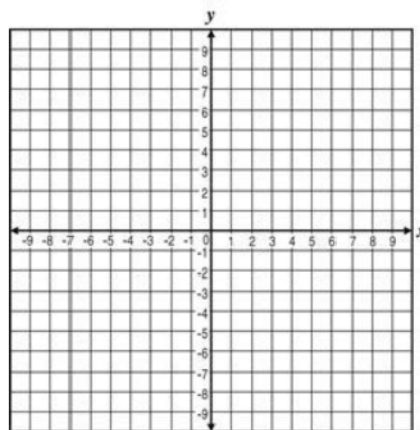
these are not the same \neq $JI \neq UL$, b/c the lengths are not the same.

JULI is not an isosceles trapezoid b/c the legs are NOT \cong .

Ah ha! Now you can see that in order to complete coordinate plane proofs with trapezoids, you are going to need to use the slope formula twice and the distance formula twice.

2. The vertices of quadrilateral KINS are $K(1,-4)$, $I(10,-4)$, $N(9,2)$, and $S(2,2)$.

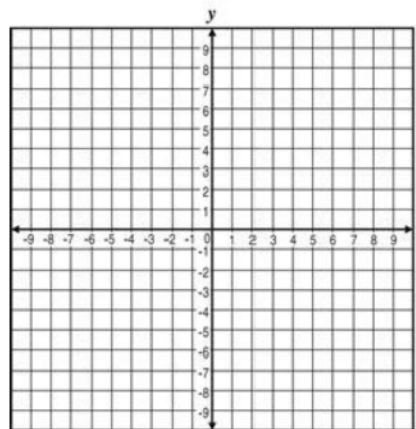
Prove that quadrilateral KINS is an isosceles trapezoid.



3. The vertices of quadrilateral ABCD are $A(1,-2)$, $B(13,4)$, $C(6,8)$, and $T(-2,4)$. Prove that quadrilateral ABCD is a trapezoid but not an isosceles trapezoid.

4. The vertices of quadrilateral EFGH are $E(1,3)$, $F(-1,1)$, $G(-1,-2)$, and $H(4,3)$.

Prove that quadrilateral EFGH is an isosceles trapezoid.



5. The vertices of quadrilateral LMNO are $L(1,5)$, $M(4,7)$, $N(7,3)$, and $O(1,-1)$.

a) Prove that LMNO is a trapezoid.

b) Prove that LMNO is not isosceles.

