DO NOW

The vertices of quadrilateral *PQRS* are *P*(1,1), *Q*(4,-2), *R*(7,1), and *S*(4,4). Is *PQ* parallel to *RS*? Show your work and explain your answer.

Slope $PQ = \frac{-2-1}{4-1} = \frac{-3}{3} = -1$

Slope $RS = \frac{4-1}{4-7} = \frac{3}{-3} = -1$

$\overline{PQ} \parallel \overline{RS}$ because their slopes are equal

Jan 24-9:52 AM

Proving a Quadrilateral is a Trapezoid

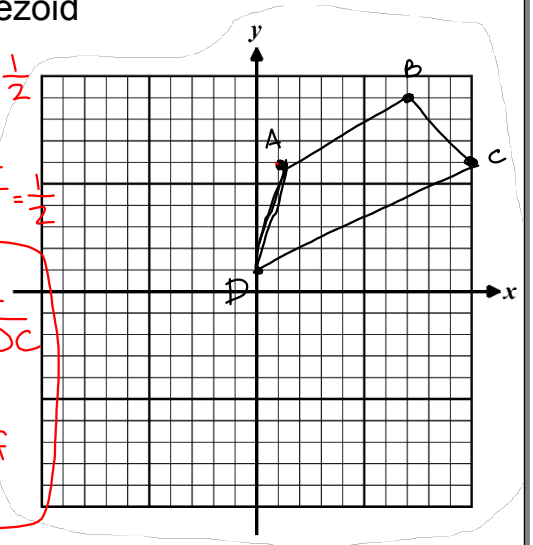
At least one pair of sides MUST BE PARALLEL

Show this using the slope formula

Given: *A*(1,6), *B*(7,9), *C*(10,6), and *D*(0,1)
Prove: *ABCD* is a trapezoid

Slope $AB = \frac{9-6}{7-1} = \frac{3}{6} = \frac{1}{2}$

Slope $DC = \frac{6-1}{10-0} = \frac{5}{10} = \frac{1}{2}$



$\overline{AB}$ and $\overline{DC}$ have the same slope so $\overline{AB} \parallel \overline{DC}$

ABCD is a trapezoid b/c it has one pair of parallel sides

Jan 3-10:00 AM

Proving a Quadrilateral is a Parallelogram

Two pairs of opposite sides parallel

Using slope formula (4x)

OR

Two pairs of opposite sides congruent

Using distance formula (4x)

OR

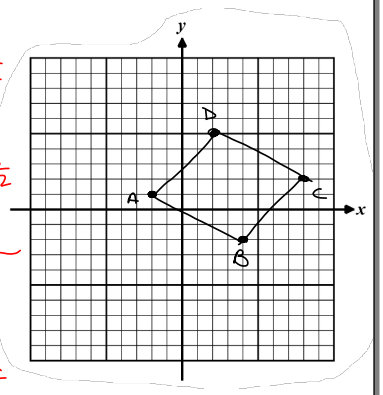
The diagonals bisect each other

Using midpoint formula (2x)

Dec 14-7:47 AM

The vertices of quadrilateral *ABCD* are *A*(-2,1), *B*(4,-2), *C*(8,2) and *D*(2,5). Prove *ABCD* is a parallelogram.

(a) Using slopes (b) Using distance (c) Using midpoints



(a)

Slope $AB = \frac{-2-1}{4-(-2)} = \frac{-3}{6} = -\frac{1}{2}$

slope $BC = \frac{2-(-2)}{8-4} = \frac{4}{4} = 1$

slope $CD = \frac{5-2}{2-8} = \frac{3}{-6} = -\frac{1}{2}$

slope $AD = \frac{5-1}{2-(-2)} = \frac{4}{4} = 1$

slope of AB = slope CD

and slope BC = slope AD,

$\overline{AB} \parallel \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$

A quad w/ two pairs of opp. sides // is a parallelogram

Dec 14-7:52 AM

The vertices of quadrilateral *ABCD* are *A*(-2,1), *B*(4,-2), *C*(8,2) and *D*(2,5). Prove *ABCD* is a parallelogram.

(a) Using slopes (b) Using distance (c) Using midpoints

(b)

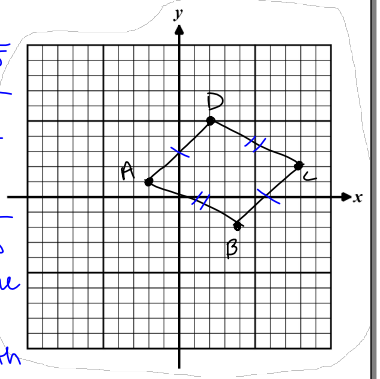
$AB = \sqrt{(-2-4)^2+(1-(-2))^2} = \sqrt{45}$

$BC = \sqrt{(4-8)^2+(-2-2)^2} = \sqrt{32}$

$CD = \sqrt{(8-2)^2+(2-5)^2} = \sqrt{45}$

$AD = \sqrt{(-2-2)^2+(1-5)^2} = \sqrt{32}$

$\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$ because they are the same length. ABCD is a parallelogram b/c both pairs of opp sides are $\cong$



Dec 14-7:52 AM

The vertices of quadrilateral *ABCD* are *A*(-2,1), *B*(4,-2), *C*(8,2) and *D*(2,5). Prove *ABCD* is a parallelogram.

(a) Using slopes (b) Using distance (c) Using midpoints

(c)

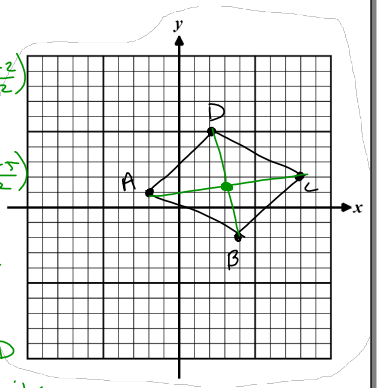
Midpoint $AC = \left(\frac{-2+8}{2}, \frac{1+2}{2}\right)$

$\left(3, \frac{3}{2}\right)$

Midpoint $BD = \left(\frac{4+2}{2}, \frac{-2+5}{2}\right)$

$\left(3, \frac{3}{2}\right)$

$\overline{AC}$ and $\overline{BD}$ have the same midpoint so they bisect each other. ABCD is a parallelogram b/c its diagonals bisect each other



Dec 14-7:52 AM

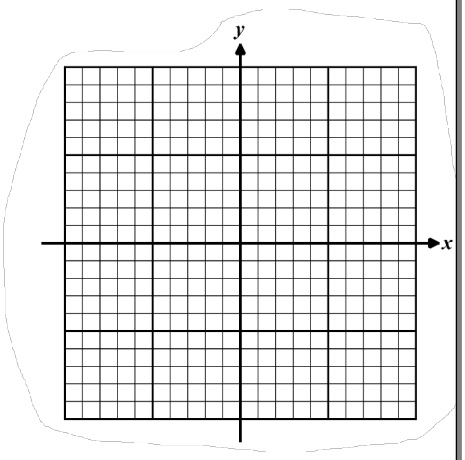
Quadrilateral *RSTU* has vertices at *R*(-4,4), *S*(2,7), *T*(5,2) and *U*(-7,-4). Show that *RSTU* is a trapezoid but *not* a parallelogram. Use of the grid is optional.

slope RS =

slope ST =

slope TU =

slope RU =



Jan 24-9:52 AM