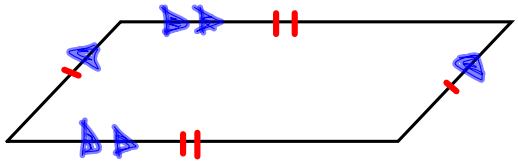
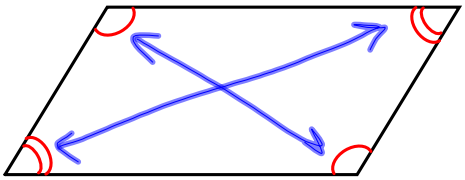
Chapter 8.3: Show that a Quadrilateral is a Parallelogram

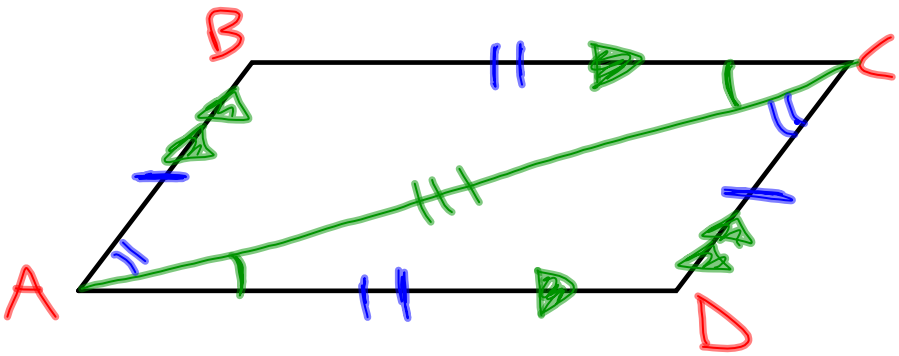
Theorem 8.7: If both pairs of opposite sides are congruent, then the quad is a parallelogram.



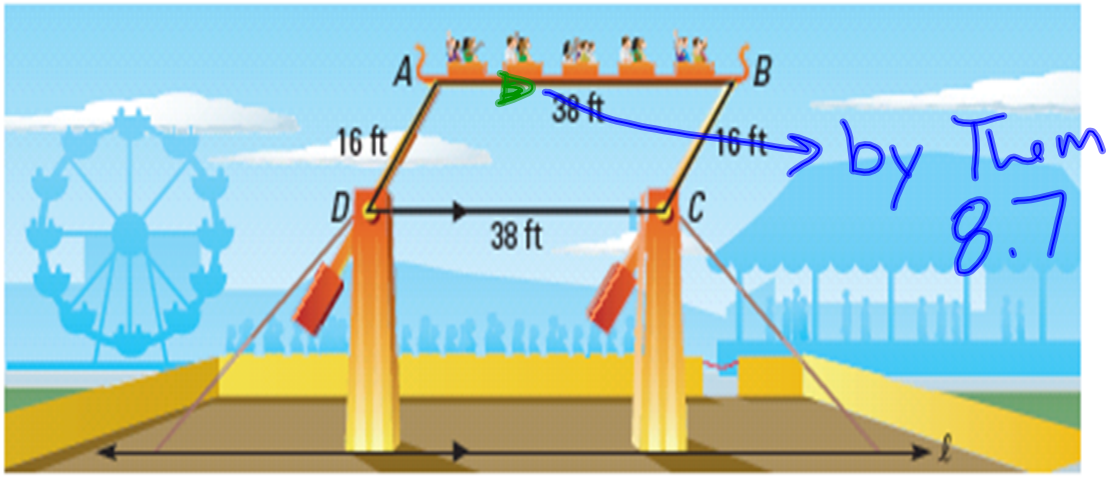
Theorem 8.8: If both pairs of opposite angles are congruent, then the quad is a parallelogram.



Prove Theorem 8.7



Why is AB always parallel to the ground(l)?

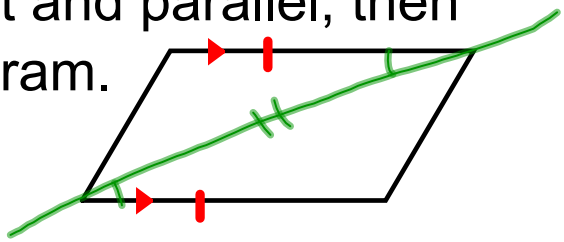


by Thm 8.7

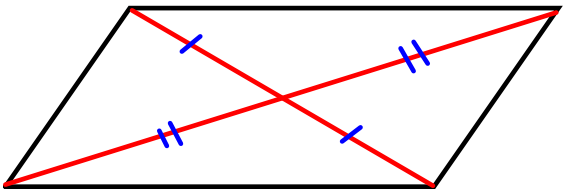
$\overline{AB} \parallel \overline{DC}$ & $\overline{DC} \parallel \ell$

$\overline{AB} \parallel \ell$

Theorem 8.9: If one pair of opposite sides of a quad are congruent and parallel, then the quad is a parallelogram.



Theorem 8.10: If the diagonals of a quad bisect each other, then the quad is a parallelogram.

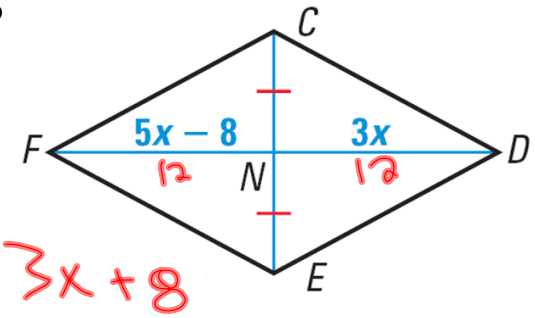


Why is SV=TU?

STVU is a parallelogram by 8.9

SV = TU by 8.3

For what value of x is quad CDEF a parallelogram?



$5x - 8 = 3x + 8$
$+8 \quad +8$

$5x = 3x + 8$
$-3x \quad -3x$

$\frac{2x}{2} = \frac{8}{2}$

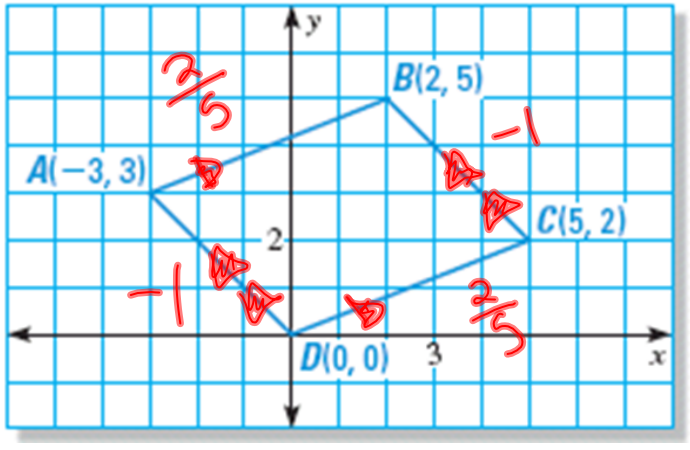
$x = 4$

Ways to prove a quad is a parallelorgram

- Show both pairs of sides are parallel(slope is the same).
- Show opposite sides are congruent(length is the same).
- Show opposite angles are the same.
- Show that opposite sides are congruent and parallel.

Show the diagonals bisect each other.

ex. show that quad ABCD is a parallelogram.



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Homework: Chapter 8.3 pg. 526 #'s 4-6,8,10,12,16,20,26