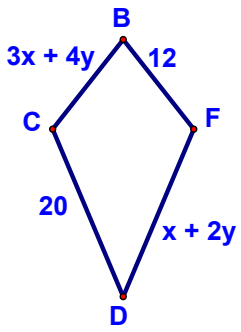
Proving that a Quadrilateral is a Parallelogram - Lesson 5-6

Here's today's warmup!

BCDF is a kite.

Find the perimeter of BCDF



Today, we learning how to prove that a quadrilateral is a Parallelgram...again, the key is to know all the properties on the Venn Diagram we did yesterday...these all fall from those and the definition of parallelograms. So, the ways to prove a quadrilateral is a parallelogram are:

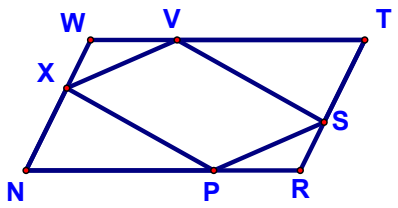
1. **If both pairs of opposite sides of a quadrilateral are parallel, then the quadrilateral is a parallelogram (reverse of the definition).**
2. **If both pairs of opposite angles of a quadrilateral are congruent, then the quadrilateral is a parallelogram (converse of a property).**
3. **If both pairs of opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram (converse of a property).**
4. **If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram (converse of a property).**
5. **If one pair of opposite sides of a quadrilateral are both parallel and congruent, then the quadrilateral is a parallelogram.**

You should note that one of the properties on the Venn Diagram is missing as a way of proving that a quadrilateral is a parallelogram...the one about the consecutive angles being supplementary. The problem with that one is that it would take a long time to prove four pairs of angles supplementary...therefore, we don't use it very often, if at all.

Here's an example using the third of these properties:

Given: ▱ NRTW
$\overline{NX} \cong \overline{TS}$
$\overline{WV} \cong \overline{RP}$

Prove: XPSV is a ▱



Statements	Reasons