

## 8.4. Honors Geometry

DATE: 2/26/13

*Target 7D. Understand and apply the theorems and postulates that are sufficient to prove triangles similar*

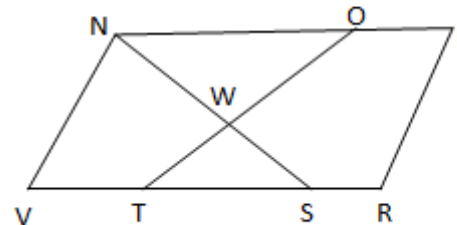
Recall that once we know two triangles are congruent, we know **C. P. C. T. C.** (**C**orresponding **S**ides of **C**ongruent **T**riangles are **C**ongruent). Similarly once we know two triangles are similar, we can use the definition of *similar polygons* to prove

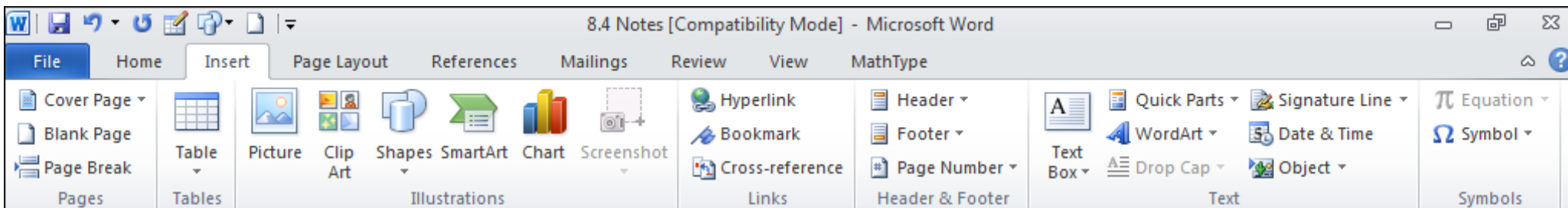
- 1) Corresponding sides of the triangles are proportional. (The ratios of the measures of corresponding sides are equal.)
- 2) Corresponding angles of the triangles are congruent.

If a problem asks you to prove that products of the measures of the sides are equal, try using the Means-Extremes Product Theorem.

Given: NPRV is a parallelogram

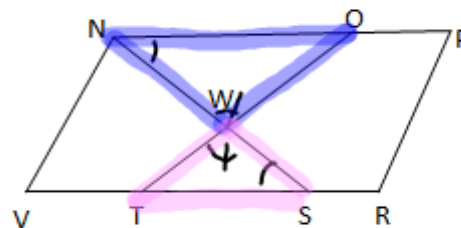
Prove:  $\frac{NW}{SW} = \frac{NO}{ST}$



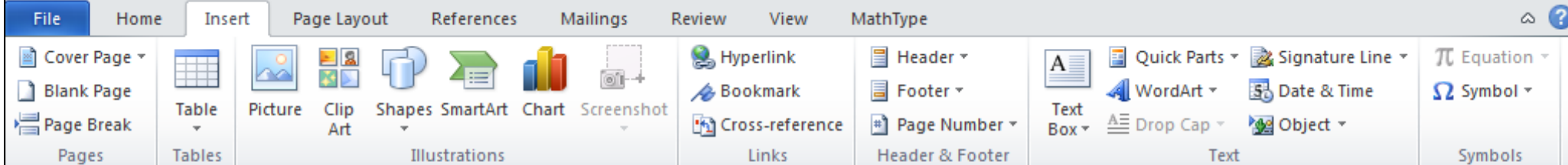


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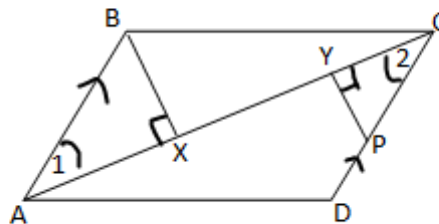


Statement	Reason
① NPRV    gram	① Given
② $\overline{NP} \parallel \overline{VR}$	②    gram $\Rightarrow$ Both pairs opposite sides parallel
③ $\angle ONW \cong \angle TSW$	③    lines $\Rightarrow$ alternate interior $\angle$ s $\cong$
④ $\angle NWO \cong \angle SWT$	④ Vertical $\angle$ s $\cong$ (We could have replaced step 4 with another pair of $\cong \angle$ s. Do you know why?)
⑤ $\triangle NWO \sim \triangle SWT$	⑤ ~ AA
⑥ $\frac{NW}{SW} = \frac{NO}{ST}$	⑥ Corresponding sides of ~ $\Delta$ s are proportional.



Given:  $\overline{AB} \parallel \overline{CD}$ ,  $\overline{BX}$  and  $\overline{PY} \perp \overline{AC}$

Prove:  $BX \cdot YC = PY \cdot XA$



Statements	Reasons
① $\overline{AB} \parallel \overline{CD}$ $\overline{BX} \perp \overline{AC}$ $\overline{PY} \perp \overline{AC}$	① Given
② $\angle 1 \cong \angle 2$	② $\parallel$ lines $\Rightarrow$ alt. int. $\angle$ s $\cong$
③ $\angle BXA$ , $\angle PYC$ rt. $\angle$ s	③ Definition of perpendicularity ( $\perp$ ).
④ $\angle BXA \cong \angle PYC$	④ Rt. $\angle$ s $\cong$
⑤ $\triangle BXA \sim \triangle PYC$	⑤ $\sim$ AA
⑥ $\frac{BX}{PY} = \frac{XA}{YC}$	⑥ Corr. sides of $\sim$ $\Delta$ s are proportional
⑦ $BX \cdot YC = PY \cdot XA$	⑦ Means-Extremes Product Theorem 