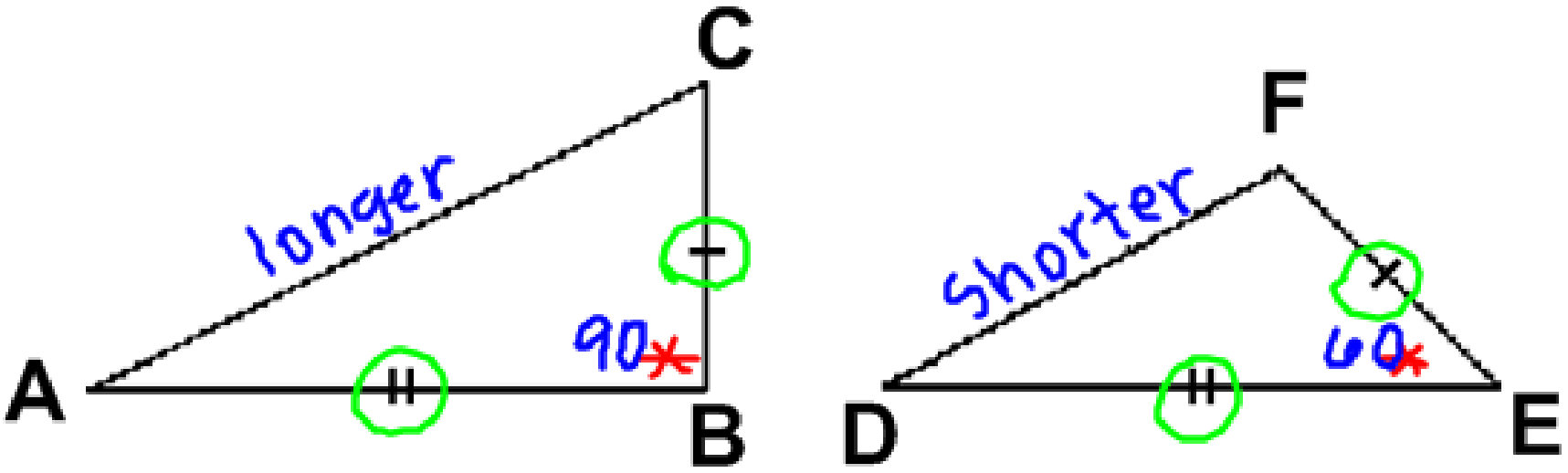
5 - 5
Inequalities Involving Two Triangles

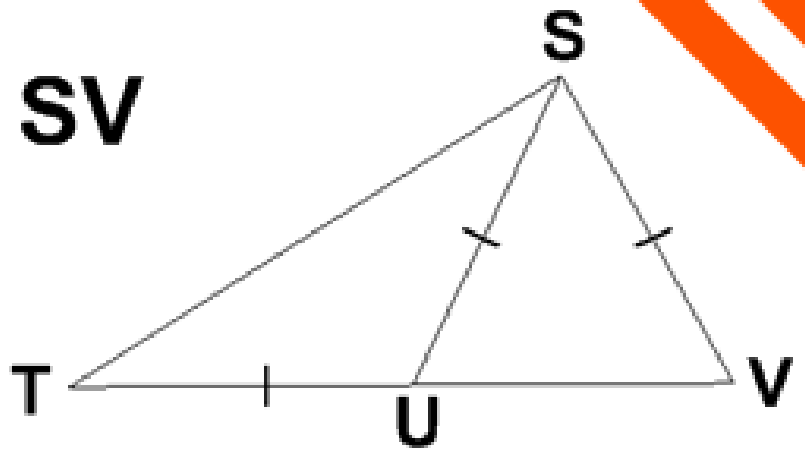
Theorem 5.13:
(SAS Inequality/Hinge Theorem)

If two sides of a triangle are congruent to two sides of another triangle and the included angle in one triangle has a greater measure than the included angle in the other, then the third side of the first triangle is longer than the third side of the second triangle.


C
longer
90°
A
B
F
Shorter
60°
D
E

Given: $TU \cong US$, $US \cong SV$

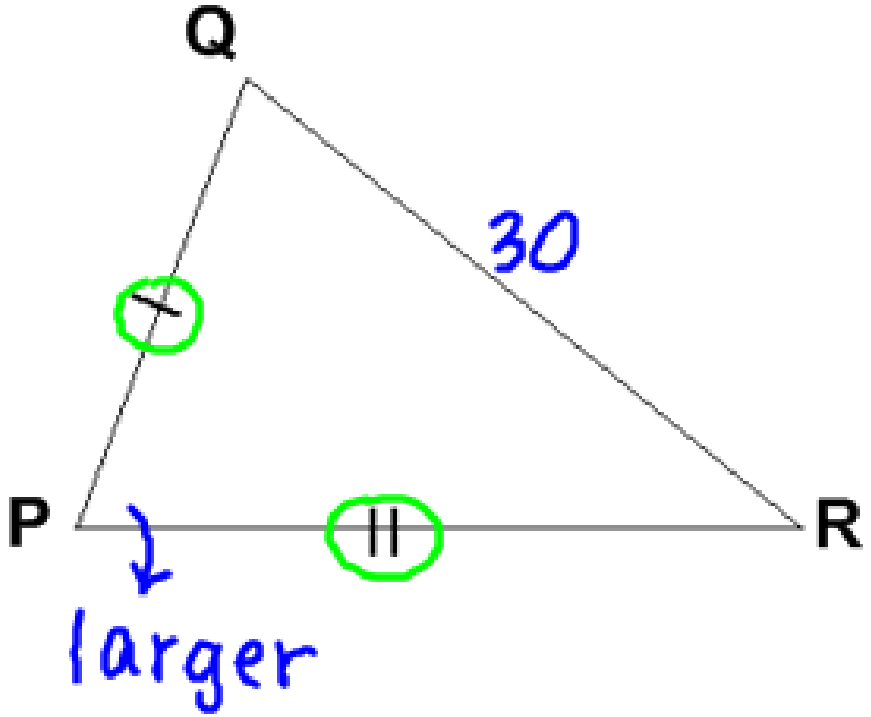
Prove: $ST > UV$

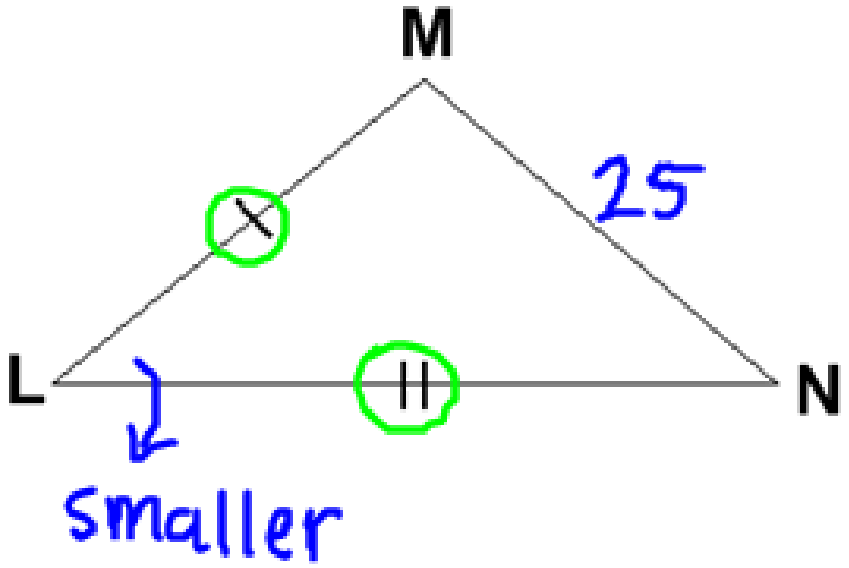


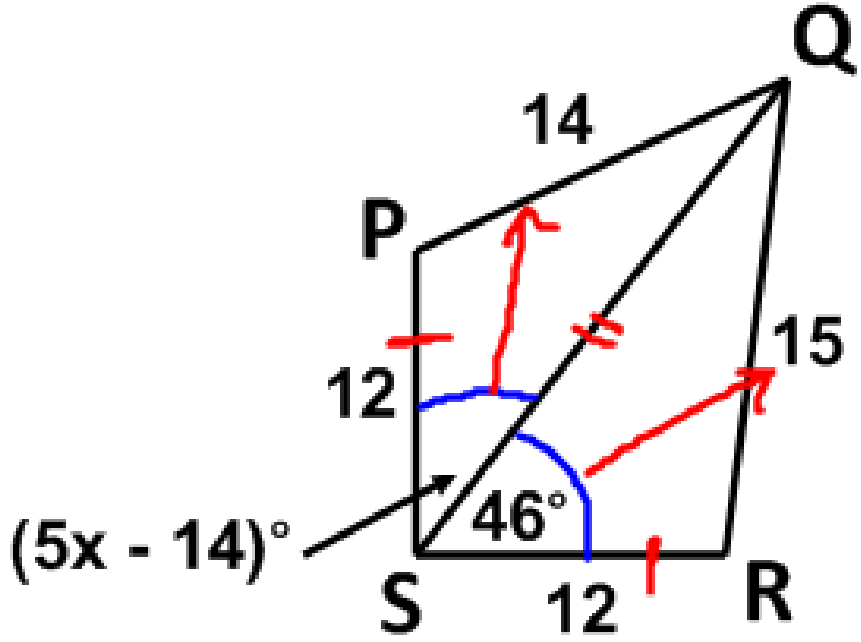
Statements	Reasons
1.	1.
2.	2.
3.	3.

Theorem 5.14:
(SSS Inequality Theorem)

If two sides of a triangle are congruent to two sides of another triangle and the third side in one triangle is longer than the third side in the other, then the angle between the pair of congruent sides in the first triangle is greater than the corresponding angle in the second triangle.

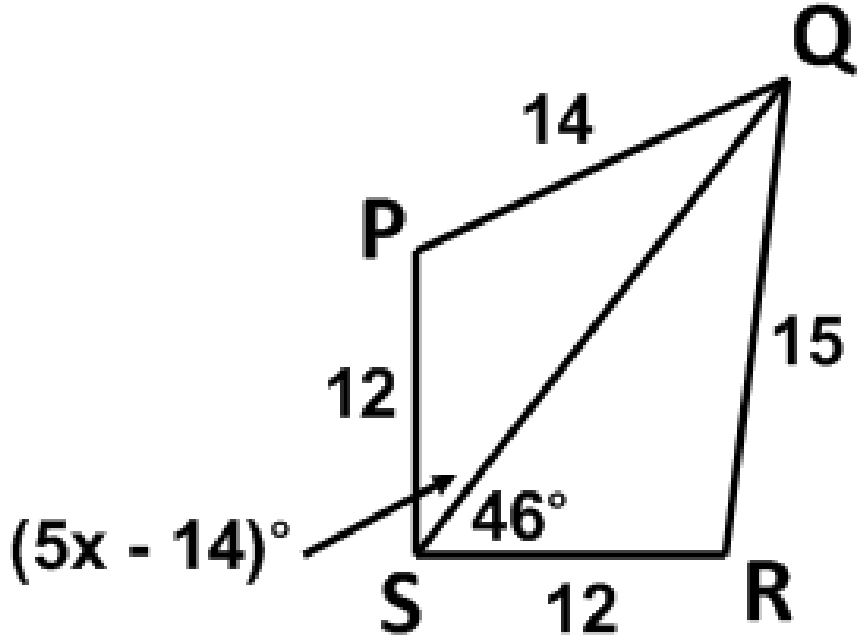

Q
30
P
R
larger


M
25
L
N
smaller



Ex: Compare m∠QSR and m∠QSP.

m∠QSR > m∠QSP



Ex: Find the range of values for x.

$m\angle QSR > m\angle QSP$

$46 > 5x - 14$

$+14 \quad +14$

$60 > 5x$

$\frac{60}{5} > \frac{5x}{5}$

$12 > x$

$x < 12$

Homework:

p. 271 #10 - 17