Lesson 5-5

The Triangle Inequality

You will use the Triangle Inequality Theorem to identify possible triangles and to prove triangle relationships

Theorem 5.11 Triangle Inequality Theorem

The sum of the lengths of any two sides of a triangle must be greater than the length of the third side.

Examples $PQ + QR > PR$

$QR + PR > PQ$

$PR + PQ > QR$

A. Is it possible to form a triangle with side lengths of $6\frac{1}{2}$, $6\frac{1}{2}$, and $14\frac{1}{2}$? If not, explain why not.

B. Is it possible to form a triangle with side lengths of 6.8, 7.2, 5.1? If not, explain why not.

STANDARDIZED TEST EXAMPLE 2

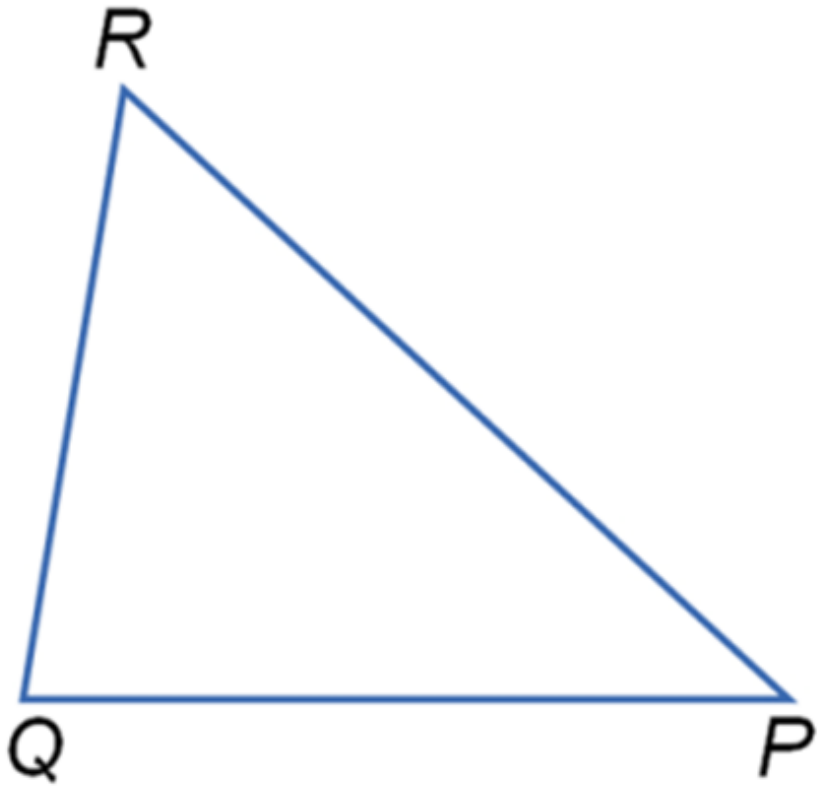
In ΔPQR, $PQ = 7.2$ and $QR = 5.2$. Which measure cannot be PR?

A 7

B 9

C 11

D 13

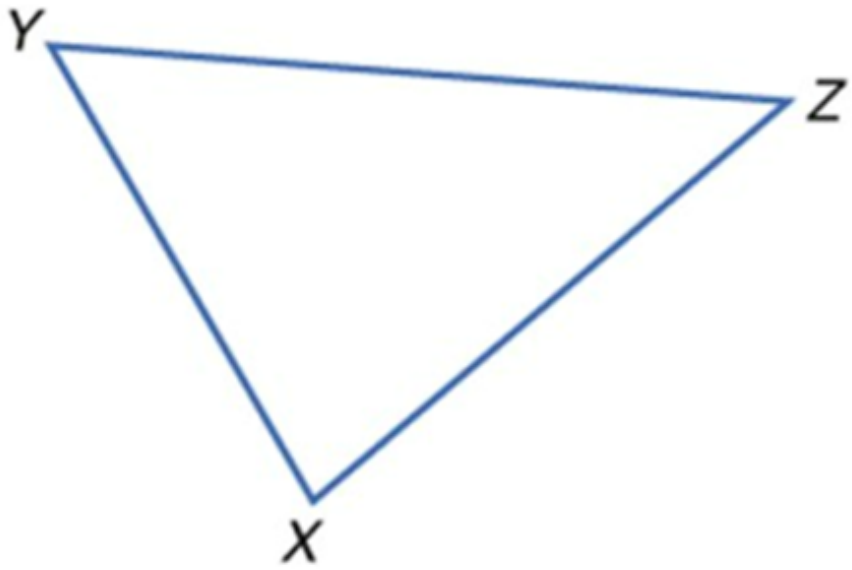


STANDARDIZED TEST EXAMPLE 2

Check Your Progress

CheckPoint

In ΔXYZ, $XY = 6$, and $YZ = 9$. Which measure cannot be XZ?



A. 4

B. 9

C. 12

D. 16

Find the range of measure of the third side of a triangle given the measures of two sides.

Subtracted

A. 7 and 12

B. 14 and 23