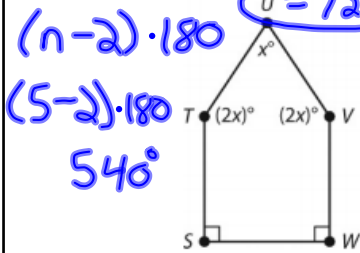


## Bell Work

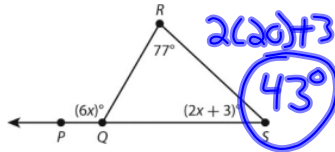
1. Find the measure of  $\angle U$   
Polygon  $STUVW$  is shown.



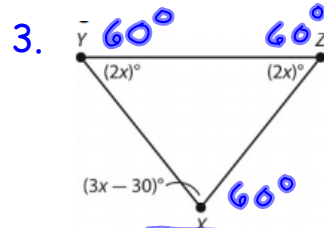
$$\begin{aligned}
 5x + 180 &= 540 \\
 -180 &-180 \\
 \hline
 5x &= 360 \\
 x &= 72^\circ
 \end{aligned}$$

2. Find the measure of  $\angle S$

$\triangle QRS$  is shown.



$$\begin{aligned}
 6x &= 2x + 3 + 77 \\
 6x &= 2x + 80 \\
 -2x &-2x \\
 \hline
 4x &= 80 \quad x = 20
 \end{aligned}$$



Is  $\triangle XYZ$  equilateral, isosceles, or neither? Explain your reasoning.

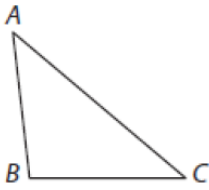
$$\begin{aligned}
 7x - 30 &= 180 \\
 +30 &+30 \\
 \hline
 7x &= 210 \\
 x &= 30^\circ
 \end{aligned}$$

## 7.3 Triangle Inequalities

Essential Question: How can you use inequalities to describe the relationships among the side lengths and angle measures in a triangle?

### Triangle Inequality Theorem

The sum of any two side lengths of a triangle is greater than the third side length.



$$AB + BC > AC$$

$$BC + AC > AB$$

$$AC + AB > BC$$

$$343 - 345, 347$$

l

**Example 1** Use the Triangle Inequality Theorem to tell whether a triangle can have sides with the given lengths. Explain.

(A) 4, 8, 10

$$4 + 8 > 10$$

Yes,  $12 > 10 \checkmark$

$$4 + 10 > 8$$
$$14 > 8 \checkmark$$

$$10 + 8 > 4$$
$$18 > 4 \checkmark$$

Determine if a triangle can be formed with the given side lengths. Explain your reasoning.

6. 12 units, 4 units, 17 units

$$12 + 4 > 17$$

No,  $16 \not> 17$

7. 24 cm, 8 cm, 30 cm

$$24 + 8 > 30$$

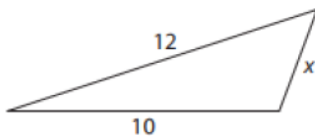
$$24 + 30 > 8$$

$$30 + 8 > 24$$

Yes,  $32 > 30 \checkmark$   $54 > 8$   
 $38 > 24$

**Example 2** Find the range of values for  $x$  using the Triangle Inequality Theorem.

(A) Find possible values for the length of the third side using the Triangle Inequality Theorem.



Small #  $< x <$  Big #

$$\begin{array}{r} x + 10 > 12 \\ -10 \quad -10 \\ \hline x > 2 \end{array}$$

~~$$\begin{array}{r} x + 12 > 10 \\ -12 \quad -12 \\ \hline x > -2 \end{array}$$~~

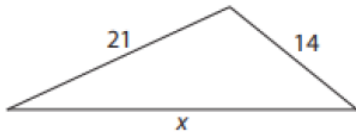
$$\begin{array}{r} 10 + 12 > x \\ 22 > x \end{array}$$

$$2 < x < 22$$

**Your Turn**

Find the range of values for  $x$  using the Triangle Inequality Theorem.

9.



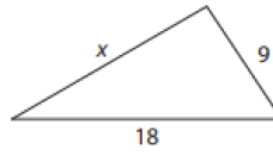
$$\begin{array}{r} x + 14 > 21 \\ -14 \quad -14 \\ \hline x > 7 \end{array}$$

~~$x + 21 > 14$~~

$$\begin{array}{r} 14 + 21 > x \\ 35 > x \end{array}$$

$7 < x < 35$

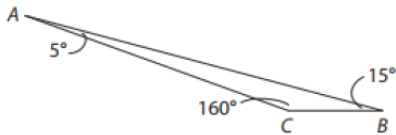
10.



**Your Turn**

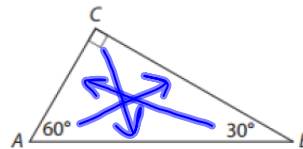
For each triangle, order the side lengths from least to greatest.

13.



CB, AC, AB

14.



AC, BC, AB

Homework  
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#5-10