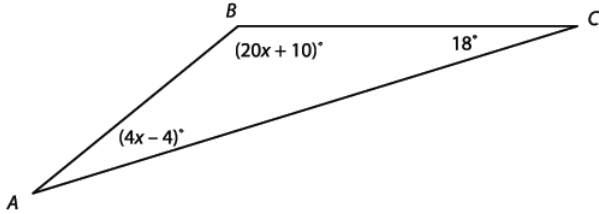


## SM2 9.2: Prove Triangle Theorems

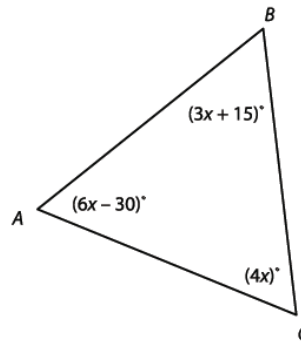
Problems:

Use what you know about the sums of the interior and exterior angles of triangles to determine the measure of each identified angle.

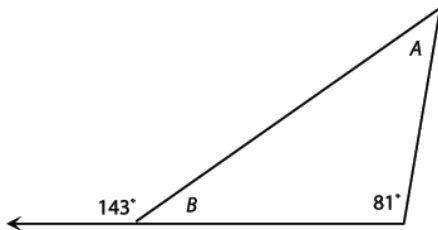
- 1) Find
- $m\angle A$
- and
- $m\angle B$



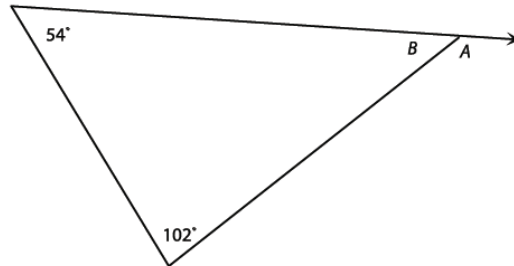
- 2) Find
- $m\angle A$
- ,
- $m\angle B$
- , and
- $m\angle C$



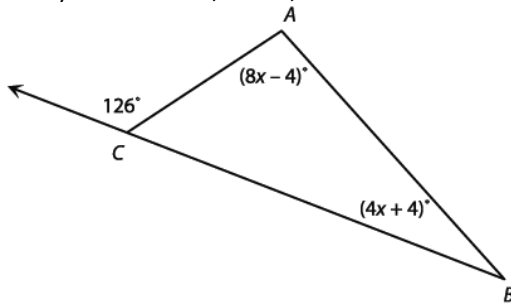
- 3) Find
- $m\angle A$
- and
- $m\angle B$



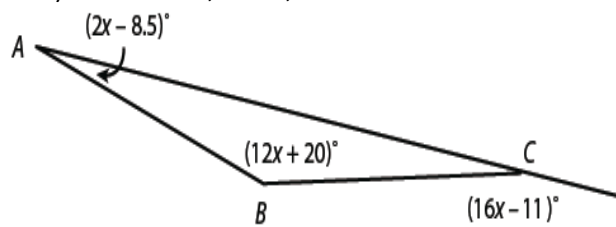
- 4) Find
- $m\angle A$
- and
- $m\angle B$



- 5) Find
- $m\angle A$
- ,
- $m\angle B$
- , and
- $m\angle ACB$

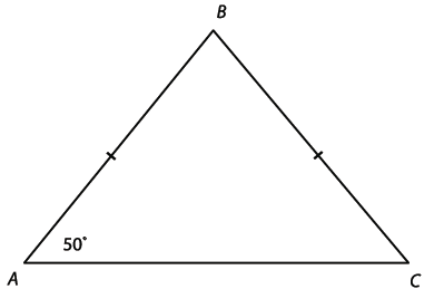


- 6) Find
- $m\angle A$
- ,
- $m\angle B$
- , and
- $m\angle ACB$

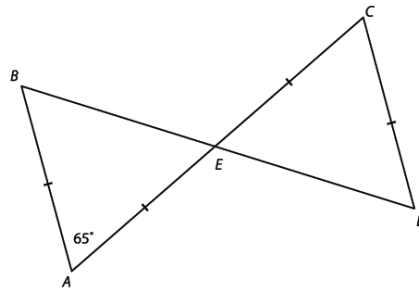


Use what you know about isosceles triangles to find each angle measure.

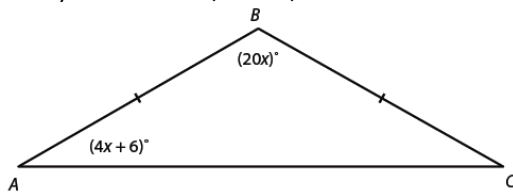
7) Find  $m\angle B$  and  $m\angle C$



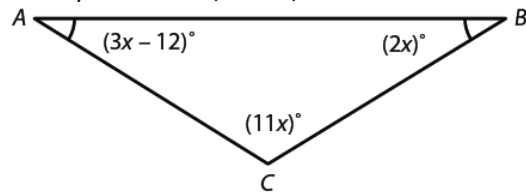
8) Find  $m\angle B$ ,  $m\angle C$ , and  $m\angle D$



9) Find  $m\angle A$ ,  $m\angle B$ , and  $m\angle C$

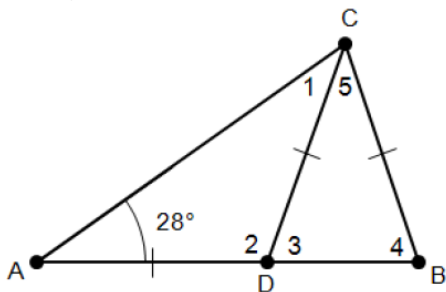


10) Find  $m\angle A$ ,  $m\angle B$ , and  $m\angle C$

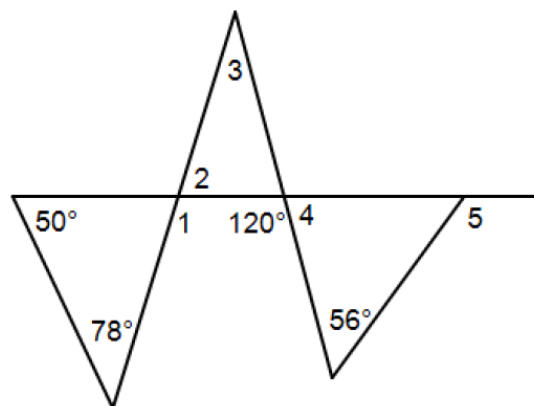


Find the missing angle measures.

11) Find  $m\angle 1$ ,  $m\angle 2$ ,  $m\angle 3$ ,  $m\angle 4$  and  $m\angle 5$

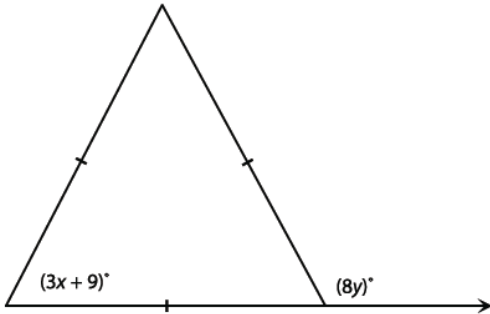


12) Find  $m\angle 1$ ,  $m\angle 2$ ,  $m\angle 3$ ,  $m\angle 4$  and  $m\angle 5$

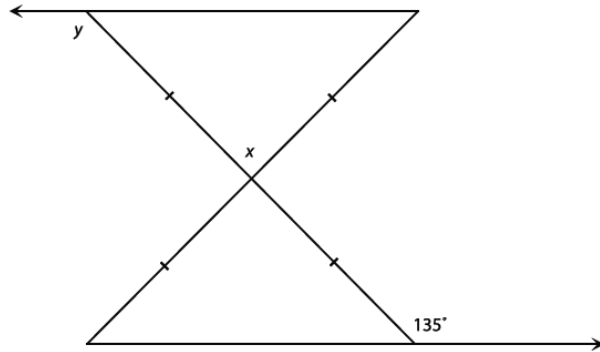


Find each value using the given information.

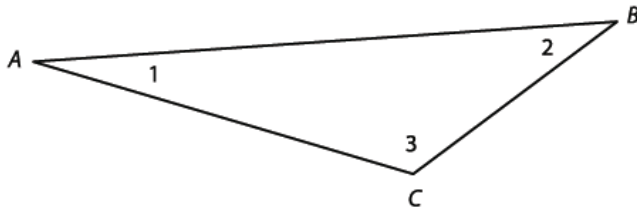
13) Find  $x$  and  $y$



14) Find  $m\angle x$  and  $m\angle y$



15) The Triangle Sum Theorem states that the sum of the angle measures of a triangle is  $180^\circ$ . Write a proof of this theorem. (Hint: you will need to add to the diagram below)



16) The converse of a statement is where you switch the "If" and "then". Example: "If  $P$ , then  $Q$ ." The converse is "If  $Q$ , then  $P$ ." The converse of a statement also needs to be proved or disproved.

The converse of the Isosceles Triangle Theorem states: If two angles of a triangle are congruent, then the sides opposite those angles are congruent. Write a proof of this statement. (You cannot use the original Isosceles Triangle Theorem to prove the converse.)

