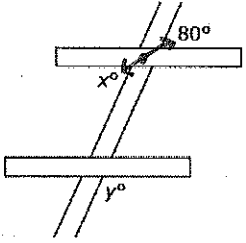


**8.G.5** Use informal arguments to establish facts about the angle sum and exterior angles triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

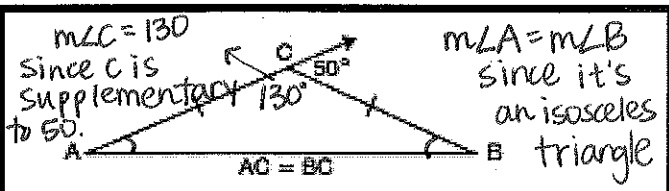
The figure shows part of a stepladder with two steps. Each step is parallel to the ground and attached to a diagonal rod.



$\angle x$  is vertical to  $80^\circ$

Which conclusion is true based on the given information and angle relationships?

- A) The value of  $x$  is 80 because vertical angles are congruent.
- B) The value of  $x$  is 80 because adjacent angles are congruent.
- C) The value of  $y$  is 100 because vertical angles are supplementary.
- D) The value of  $y$  is 100 because alternate exterior angles are supplementary.



In triangle ABC, the measure of angle A is:

- A.  $25^\circ$
- B.  $40^\circ$
- C.  $45^\circ$
- D.  $50^\circ$

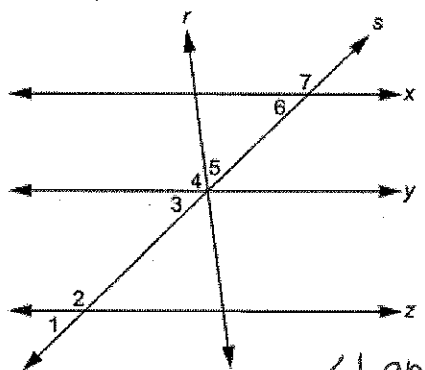
$m\angle C = 130$   
Since C is supplementary to 50.  
 $m\angle A = m\angle B$   
Since it's an isosceles triangle

$\angle A + \angle B + \angle C = 180$   
 $A + B + 130 = 180$   
 $-130 \quad -130$   
 $A + B = 50$

interior angles of a triangle

Since  $A = B$  then each is  $25^\circ$   
 $(\frac{50}{2} = 25)$

In the diagram below, lines  $x$ ,  $y$ , and  $z$  are all parallel, and lines  $r$  and  $s$  intersect at line  $y$ .

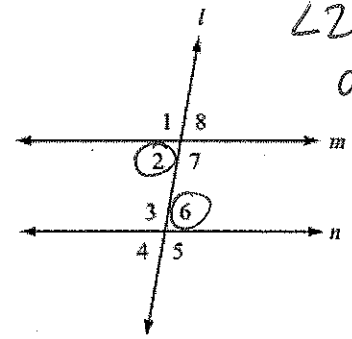


Which equation must be true?

- A.  $m\angle 1 = 180^\circ - m\angle 7$
- B.  $m\angle 2 = 90^\circ + m\angle 5$
- C.  $m\angle 3 + m\angle 4 = m\angle 7$
- D.  $m\angle 5 + m\angle 6 = m\angle 7$

$\angle 1$  and  $\angle 7$  are same side exterior angles, so they are suppl.  
 $\angle 1 + \angle 7 = 180$ , so  $\angle 1 = 180 - \angle 7$

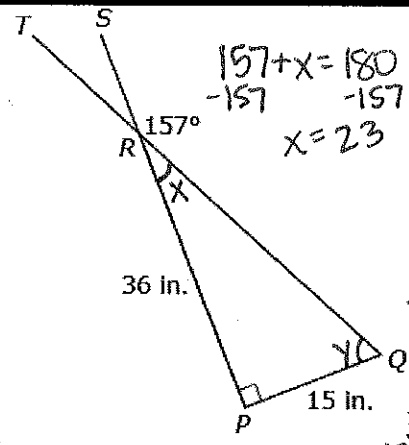
Line  $m$  and line  $n$  are parallel lines intersected by a transversal line  $l$ , as shown below.



$\angle 2$  and  $\angle 6$  are alternate interior angles (so they're congruent)

Which of the following angle pairs are congruent?

- A.  $\angle 1$  and  $\angle 8$
- B.  $\angle 2$  and  $\angle 6$
- C.  $\angle 6$  and  $\angle 7$
- D.  $\angle 8$  and  $\angle 5$



$157 + x = 180$   
 $-157 \quad -157$   
 $x = 23$

Line segments PS and QT intersect at point R. Point R is a vertex of right triangle RPQ.

$23 + 90 + y = 180$   
 $-113 + y = 180$   
 $-113 \quad -113$   
 $y = 67$

Part A: What is the measure of angle PQR? Explain.  
 $\angle PRQ$  is supplementary to 157, so it must be  $23^\circ$ . The interior angles of a triangle add up to 180, so  $23 + 90 + \angle PQR = 180$ .

Part B: What is the length of segment RQ? Explain.  
RP and PQ are legs in a right triangle, so  $\angle PQR = 67^\circ$   
 $36^2 + 15^2 = RQ^2$   
 $1296 + 225 = RQ^2$   
 $\sqrt{1521} = RQ$   
 $39 \text{ in.} = RQ$