



TRIANGLE SUMS

Triangle sum theorem
Third angle postulate
Third angle theorem

AMC 8

**Nov. 12 in
Class**

Time Left:

Connie multiplies a number by 2 and gets 60 as an answer. However, she should have divided the number by 2 to get the correct answer. What is the correct answer?

(A) 7.5

(B) 15

(C) 30

(D) 120

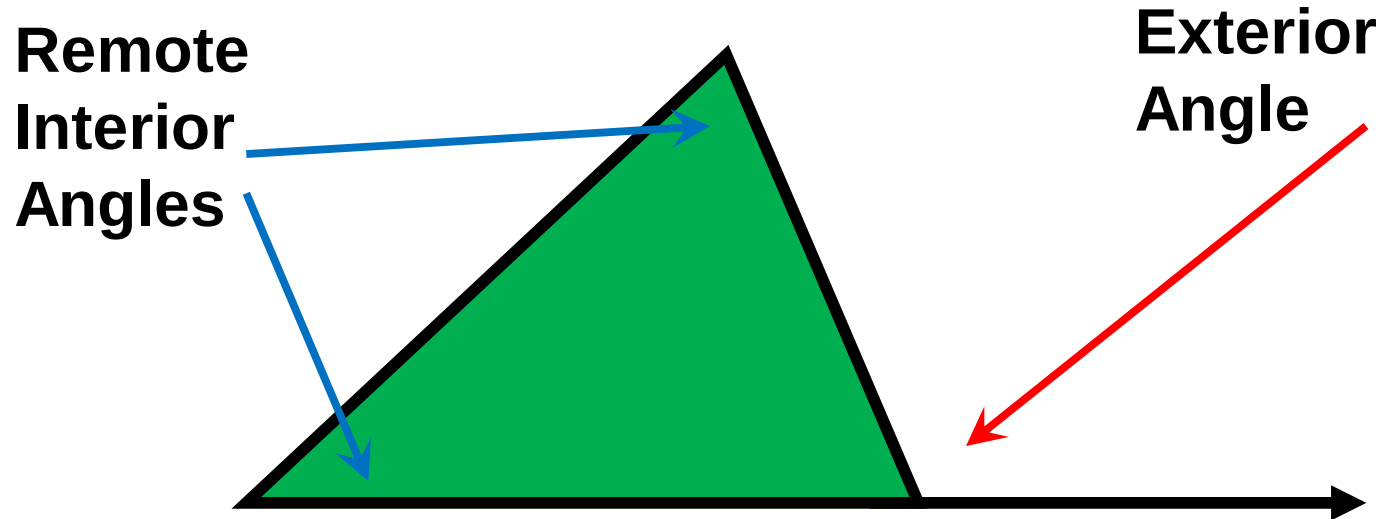
(E) 240

Time Left:

Karl bought five three-ring binders from Pay-A-Lot at a cost of \$2.50 each. Pay-A-Lot had a 20%-off sale the following day. How much could Karl have saved on the purchase by waiting a day?

- (A) \$1.00 (B) \$2.00 (C) \$2.50 (D) \$2.75 (E) \$5.00

Exterior Angle

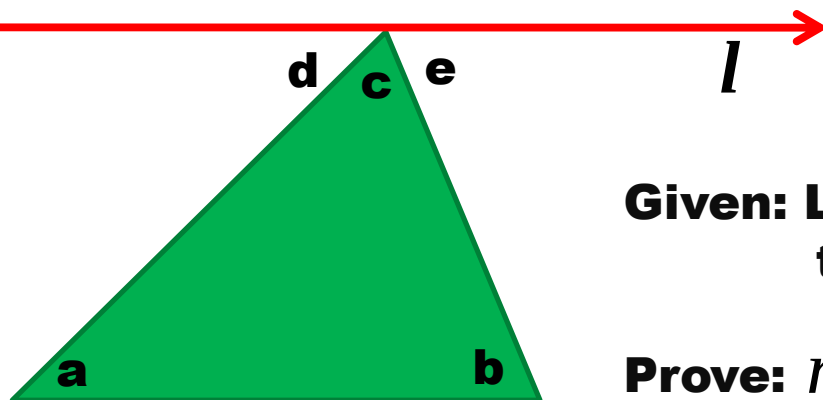


If you extend one side of a triangle from the vertex, you form an exterior angle.

Exploring...

What would you conjecture is the relationship between all the angles in a triangle?

What would you conjecture is the relationship between remote interior angles and the exterior angle in a triangle?



Given: Line l is parallel to the base of the triangle

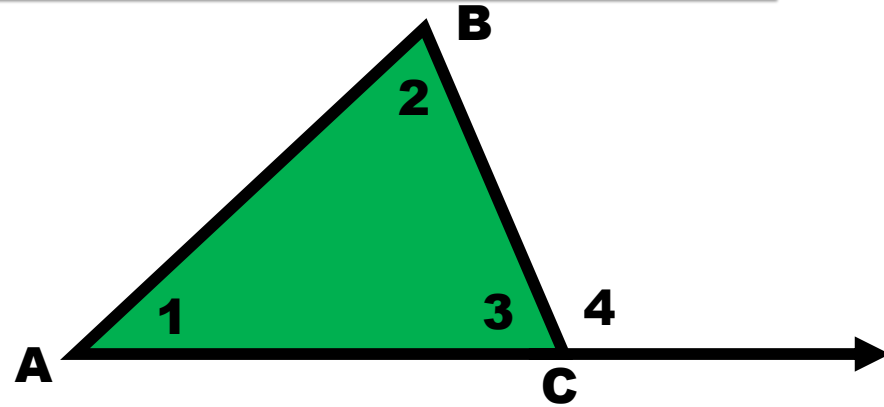
Prove: $m\angle a + m\angle b + m\angle c = 180$

Statements

Reasons

Given: $\triangle ABC$ as shown

Prove: $m\angle 1 + m\angle 2 = m\angle 4$



Statements

Reasons

Triangle Sum Theorem



POK

The ____ of all the ____ in a triangle is ____.



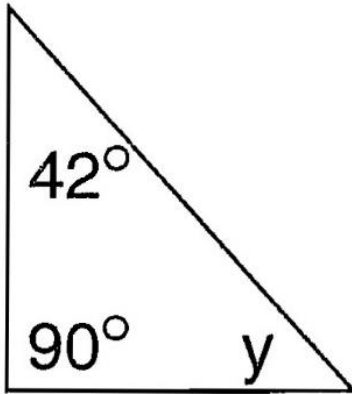
POK

Triangle Exterior Angle Theorem

The measure of an exterior angle of a triangle is ____ to the ____ of the ____.

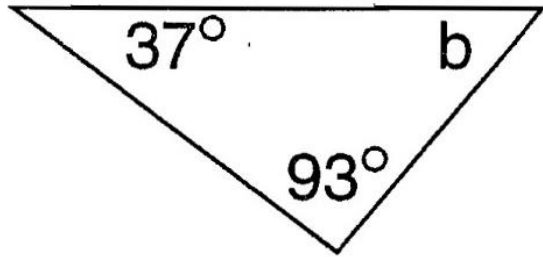
What do all the interior angles add up to in a triangle?

1) Find the missing angle algebraically.



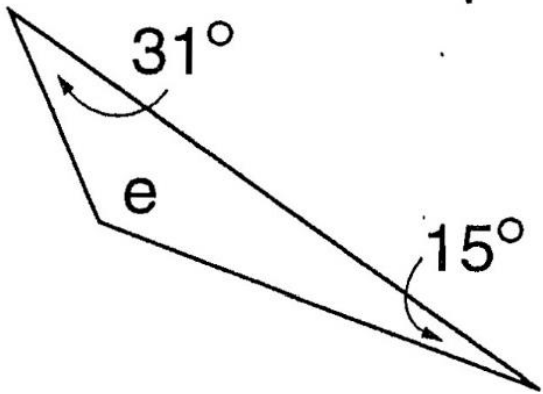
What do all the interior angles add up to in a triangle?

2) Find the missing angle algebraically.

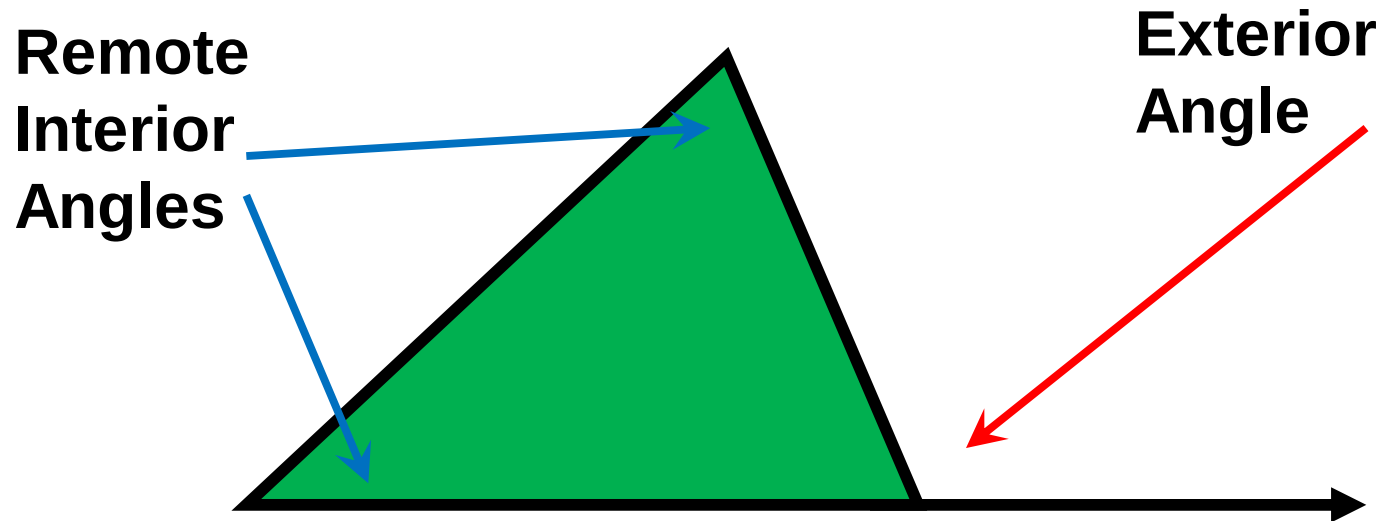


What do all the interior angles add up to in a triangle?

3) Find the missing angle algebraically.



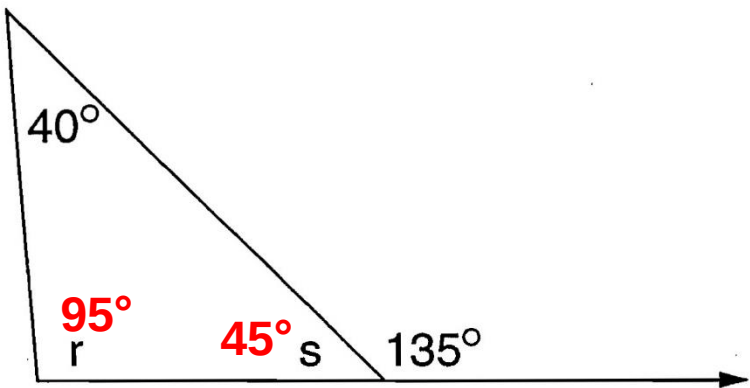
Exterior Angle



If you extend one side of a triangle from the vertex, you form an exterior angle.

Find the missing variables. (For this problem you don't need to solve it algebraically)

4)



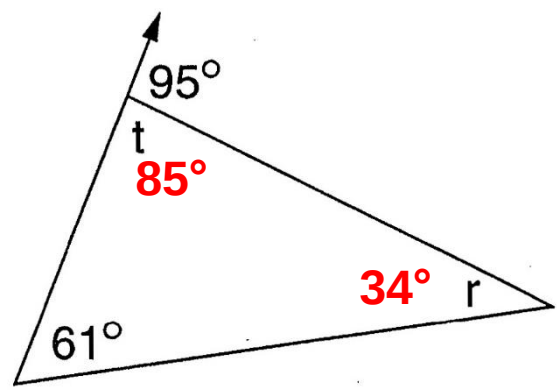
Color the remote interior angles the same color.

Color the exterior angle a different color.

What do you notice is the relationship between the exterior angle and the remote interior angles?

Find the missing variables. (For this problem you don't need to solve it algebraically)

5)



Color the remote interior angles the same color.

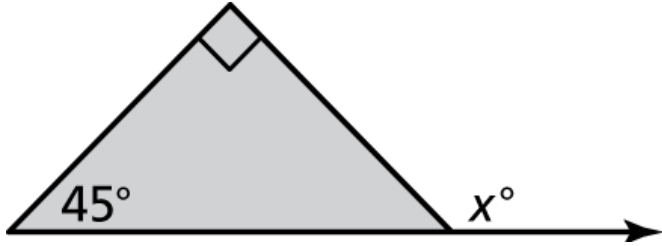
Color the exterior angle a different color.

What do you notice is the relationship between the exterior angle and the remote interior angles?

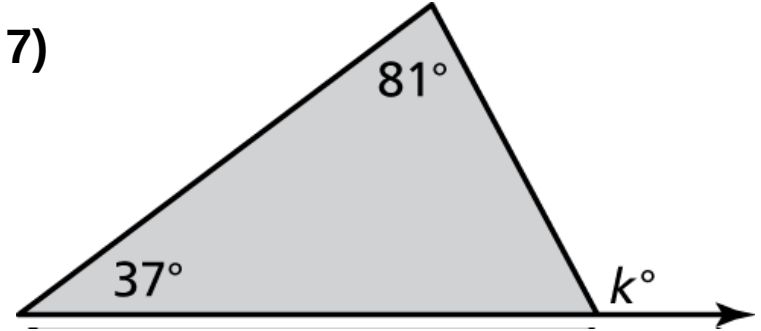
Practice

Find the missing angle algebraically.

6)

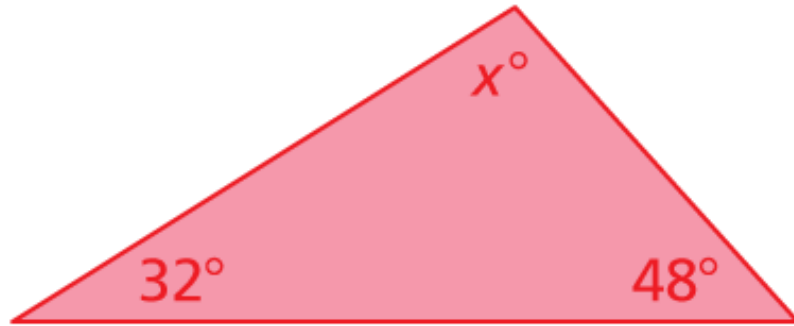


7)



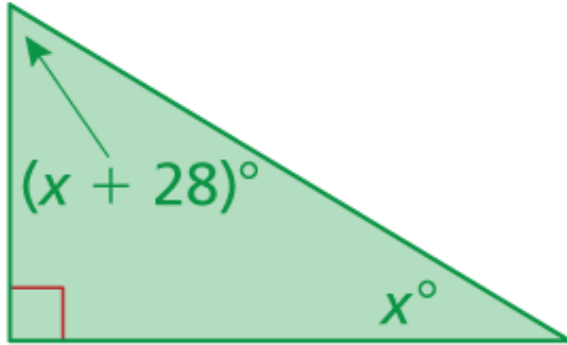
Putting it all together...

7) Find value of x algebraically.



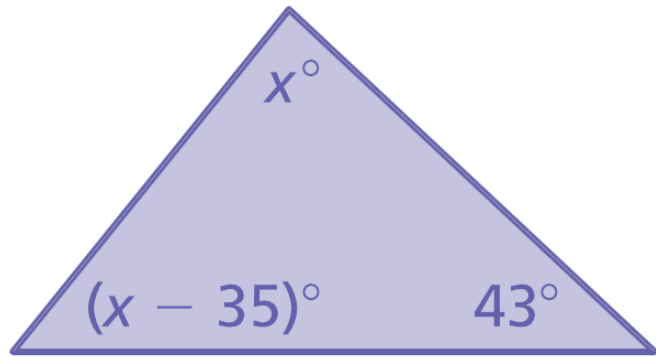
Putting it all together...

8) Find value of x algebraically.



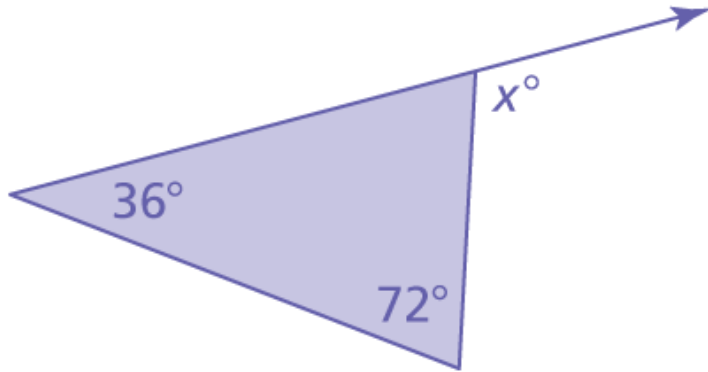
Putting it all together...

9) Find value of x algebraically.



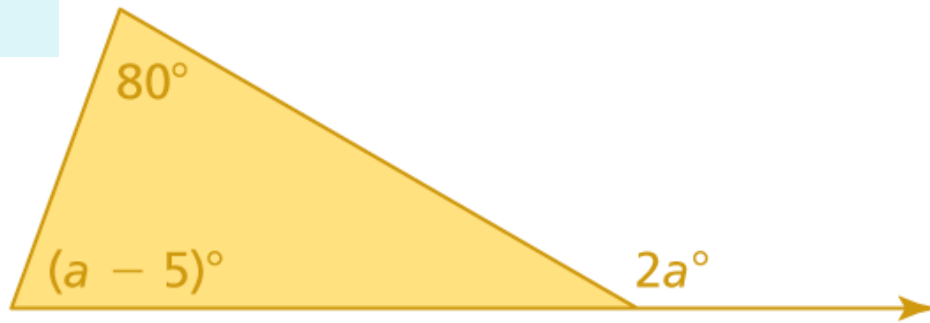
Find the missing variables algebraically.

10)

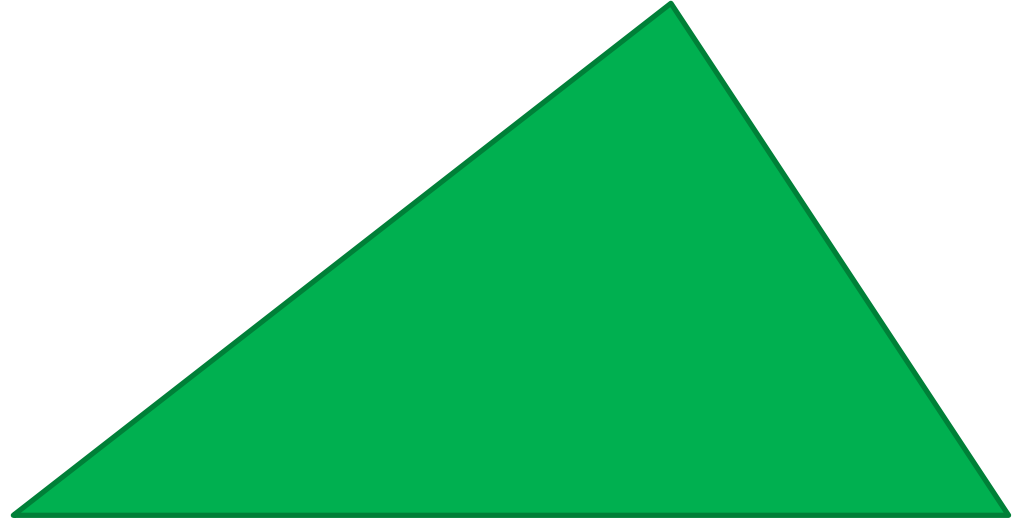
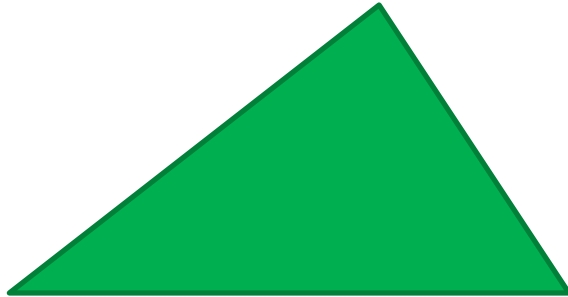


Find the missing variables algebraically. Afterwards, find the measure of the exterior angle.

10)



Third Angle Theorem



If _____ one triangle are congruent
to _____ in an other triangle, then
_____ .

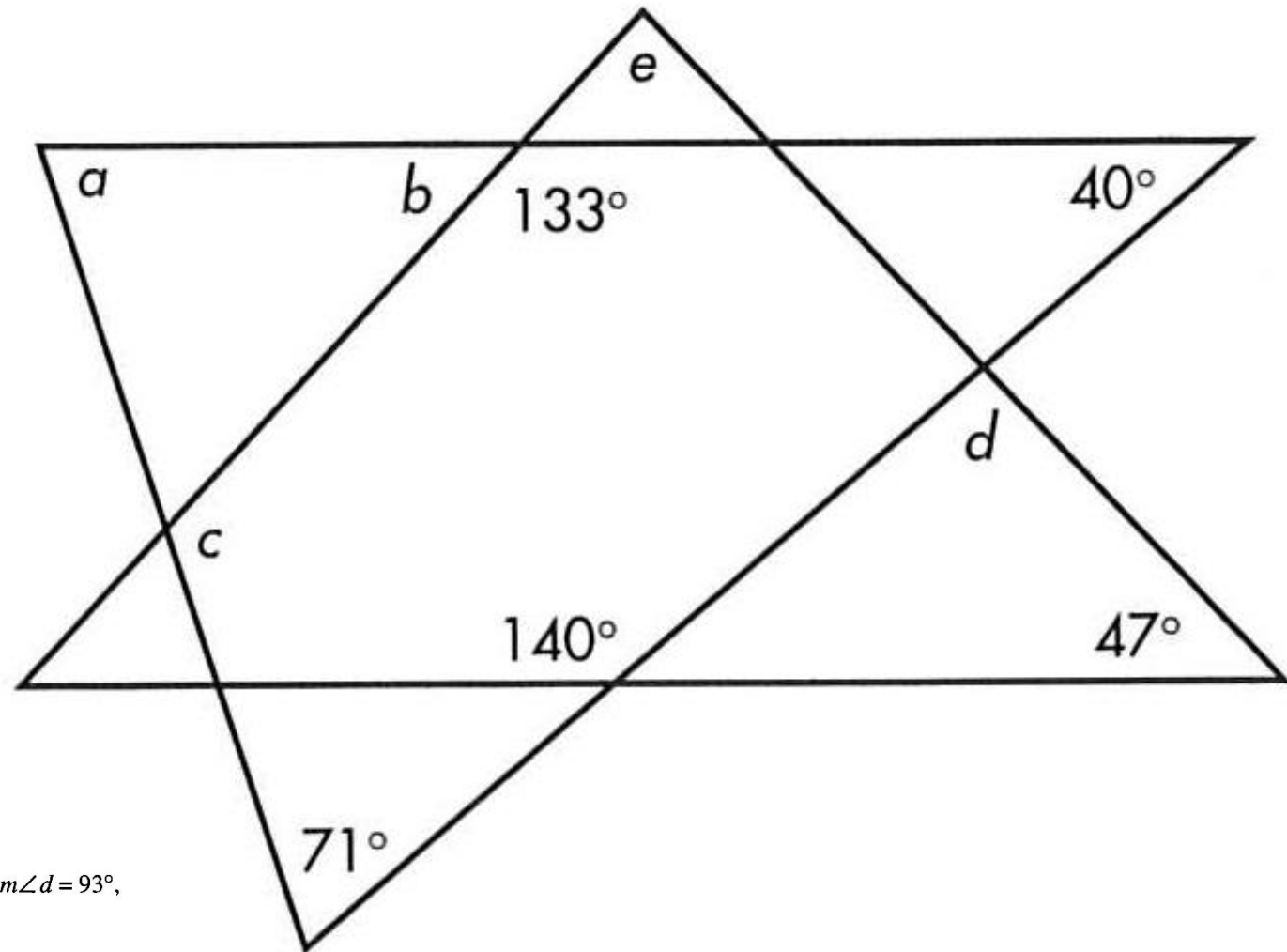
7.* $a = -?-$

$b = -?-$

$c = -?-$

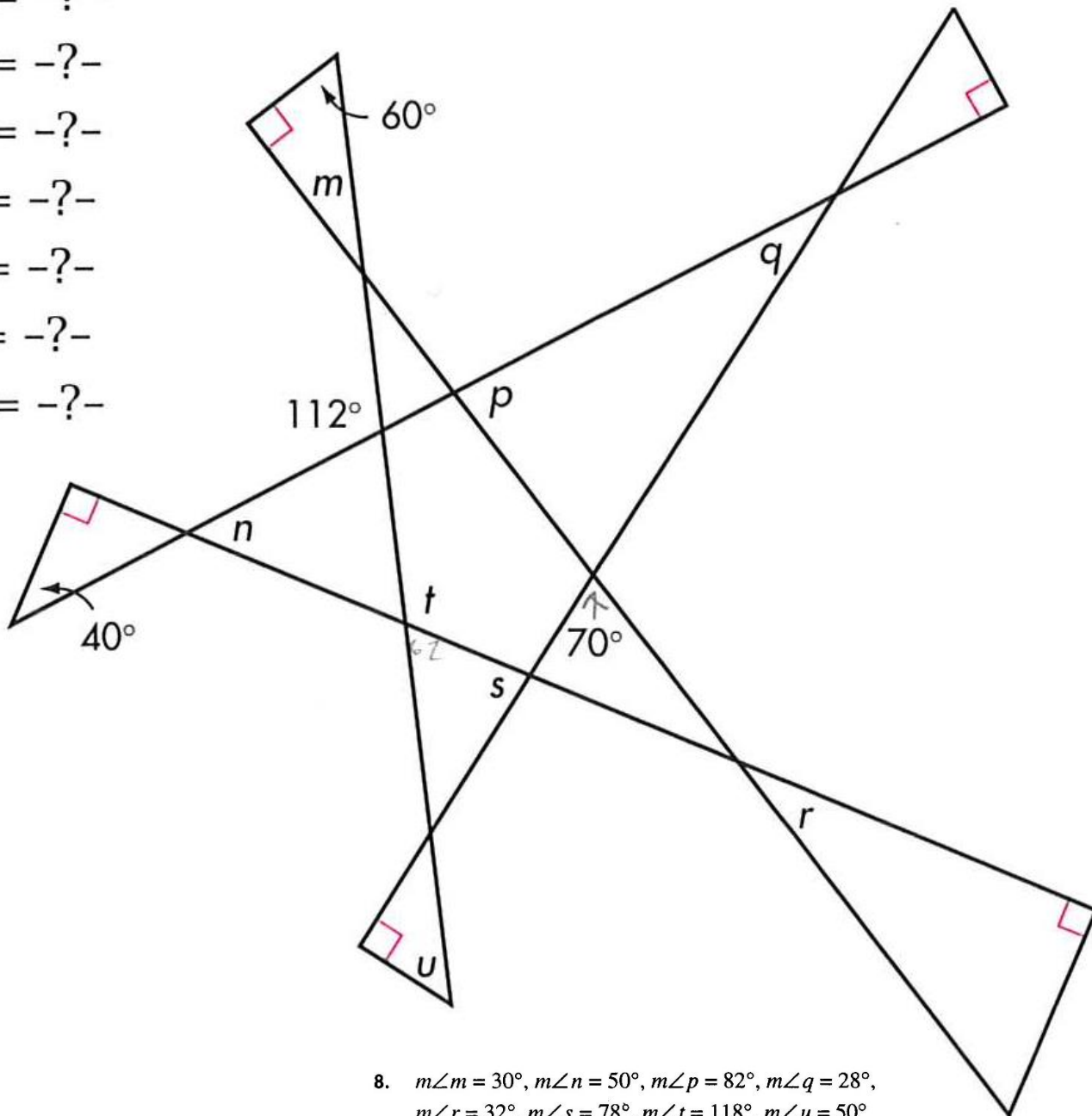
$d = -?-$

$e = -?-$



7. $m\angle a = 69^\circ$, $m\angle b = 47^\circ$, $m\angle c = 116^\circ$, $m\angle d = 93^\circ$,
 $m\angle e = 86^\circ$

8. $m = -?-$
 $n = -?-$
 $p = -?-$
 $q = -?-$
 $r = -?-$
 $s = -?-$
 $t = -?-$
 $u = -?-$



8. $m\angle m = 30^\circ, m\angle n = 50^\circ, m\angle p = 82^\circ, m\angle q = 28^\circ,$
 $m\angle r = 32^\circ, m\angle s = 78^\circ, m\angle t = 118^\circ, m\angle u = 50^\circ$