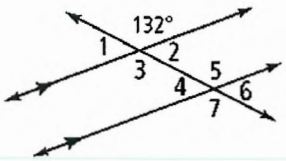
Name_____ Date_____

3.2 – Properties of Parallel Lines

Identify all the numbered angles that are congruent to the given angle. Justify your answers.

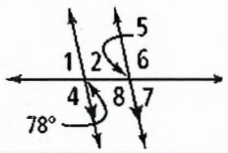
Example: $\angle 5 - CA, \angle 7 - AEA$, *etc.* (If more than one reason, please state.)

1)



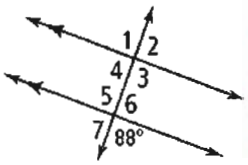
∠3 VA
∠5 CA
∠7 AEA

2)



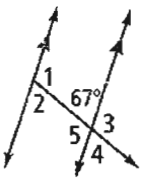
∠1 VA
∠5 AIA
∠7 CA

3)



∠5 VA
∠3 CA
∠1 AEA

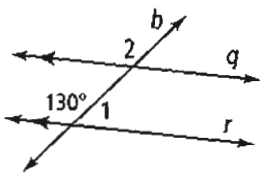
4)



∠4 VA
∠2 AIA

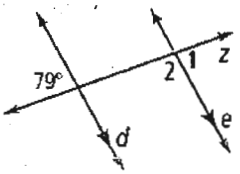
Find $m\angle 1$ and $m\angle 2$. Justify each answer.

5)



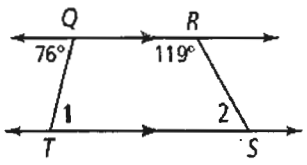
m∠1 = 50° Lin Pair
m∠2 = 130° CA

6)



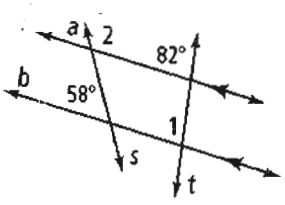
m∠1 = 79° AEA
m∠2 = 101 Lin. Pair w/ ∠1

7)



m∠1 = 76° AIA
m∠2 = 61° SSI

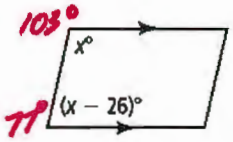
8)



m∠1 = 82° CA
m∠2 = 122°
Linear Pair and CA

Find the value of x. Then find the measure of each labeled angle. Show all algebraic work.

9)



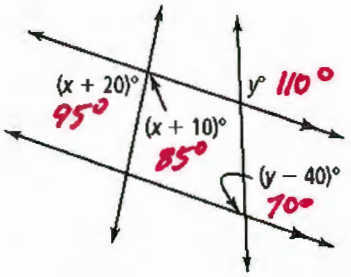
$x + (x-26) = 180$

$2x - 26 = 180$

$2x = 206$

$\boxed{x = 103°}$

10)



$(x+20) + (x+10) = 180$

$2x + 30 = 180$

$2x = 150$

$x = 75°$

$y + (y-40) = 180$

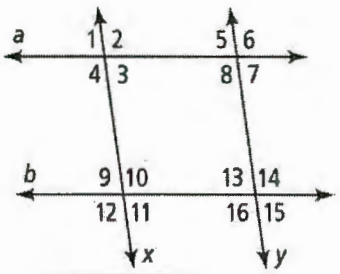
$2y - 40 = 180$

$2y = 220$ $\boxed{y = 110°}$

11) Write a two-column proof.

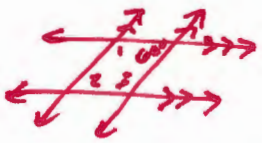
Given: $a \parallel b, x \parallel y$

Prove: $\angle 4$ is supplementary to $\angle 15$.



Statement	Reasons
1. a∥b, x∥y	Given
2. $\angle 15 \cong \angle 9$	AEA
3. $m\angle 15 = m\angle 9$ ← sorry!	Def. of Congruency
4. $\angle 9$ and $\angle 4$ are supplementary	SSI
5. $m\angle 9 + m\angle 4 = 180$	Def of Supp. Ls
6. $m\angle 15 + m\angle 4 = 180$	Substitution Prop
7. $\angle 15$ and $\angle 4$ are supp.	Def. of supp. Ls

12) One pair of parallel lines intersect a second pair of parallel lines. One of the angles of intersection has a measure of 60. How can you determine the measure of the four interior angles? Draw a sketch to support your answer.



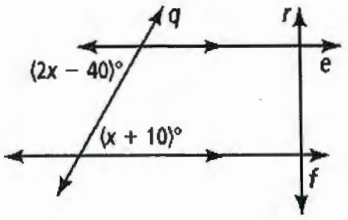
I would use SSI to figure all the other angles.

13) Analyze the solutions below. Which solution for the figure at the right is incorrect? Explain.

a) $2x - 40 = x + 10$
$x - 40 = 10$
$x = 50$

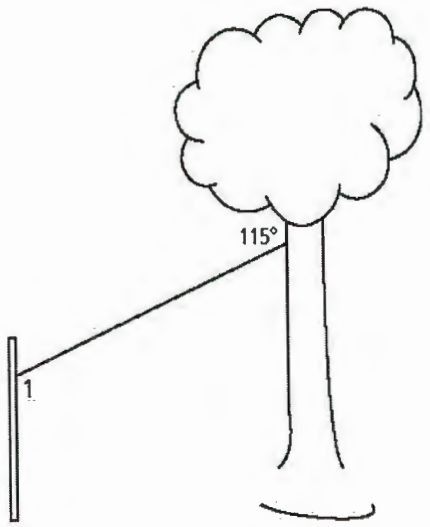
b) $2x - 40 + (x + 10) = 180$
$3x - 30 = 180$
$3x = 210$
$x = 70$ Incorrect

AIA are ≅ not supplementary

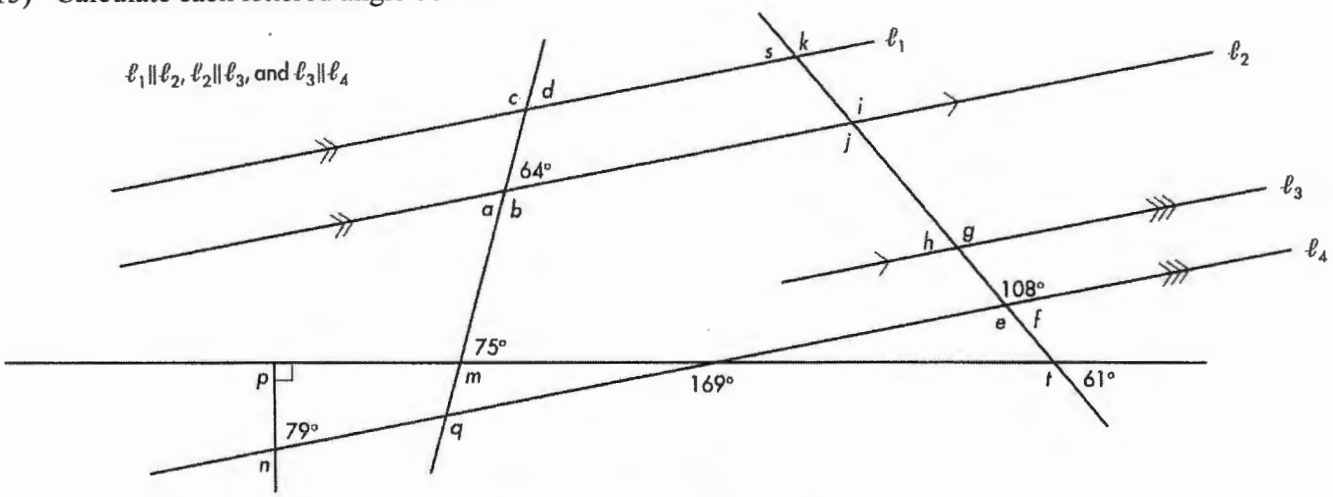


14) A zip line consists of a pulley attached to a cable that is strung at an angle between two objects. In the zip line at the right, one end of the cable is attached to a tree. The other end is attached to a post parallel to the tree. What is the measure of ∠1? What type of angle pair do ∠1 and the given angle represent?

115°, AIA



15) Calculate each lettered angle below.



a = 64° d = 64° g = 108° j = 108° n = 79° s = 72°

b = 116° e = 108° h = 72° k = 108° p = 90° t = 119°

c = 116° f = 72° i = 108° m = 105° q = 116°