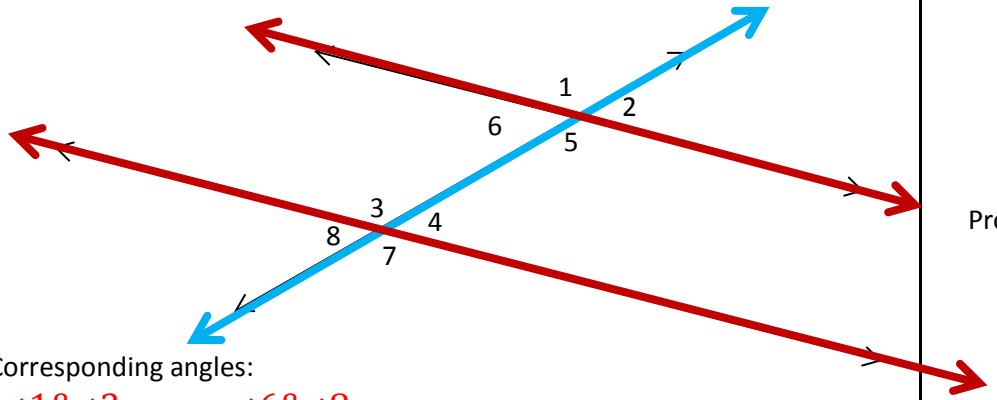
Geometry (G.CO.9)
Unit One B: Angles Formed by Intersecting Lines (IC20)

Name: _____
Date: _____ Period: _____

When encountering parallel lines (draw the arrows) that are intersected by a transversal, many different angles are created.



a. Corresponding angles:

∠1&∠3 ∠6&∠8

∠2&∠4 ∠5&∠7

b. Alternate interior angles:

∠6&∠4 ∠5&∠3

c. Alternate exterior angles:

∠1&∠7 ∠2&∠8

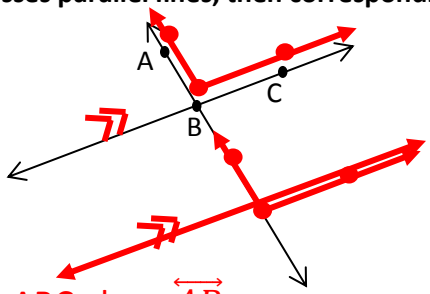
d. Same-side interior angles:

∠6&∠3 ∠5&∠4

e. Same-side exterior angles:

∠1&∠8 ∠2&∠7

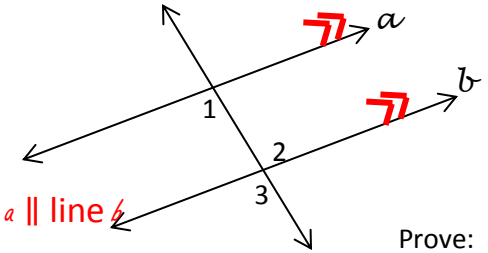
If a transversal crosses parallel lines, then corresponding angles are _____



Proof:

* Translate ∠ABC along $\overleftrightarrow{AB}$
* Draw line through B' and C' → $\overleftrightarrow{BC}$ and $\overleftrightarrow{B'C'}$ are parallel
* ∠ABC ≅ ∠A'B'C' (rigid motion)

If a transversal crosses parallel lines, then alternate interior angles are ___



Given: Line a ∥ line b Prove: ∠1 ≅ ∠2

Statements	Reasons
1) Line a ∥ line b	1) Given
2) ∠1 ≅ ∠3	2) ∥ lines → corr. ∠'s ≅
3) ∠2 ≅ ∠3	3) Vert ∠'S thm
4) ∠1 ≅ ∠2	4) Transitive Prop (2,3)

If the lines that are intersected are parallel, additional statements can be made.

a. If lines are parallel, corresponding angles are ≅

b. If lines are parallel, alternate interior angles are ≅

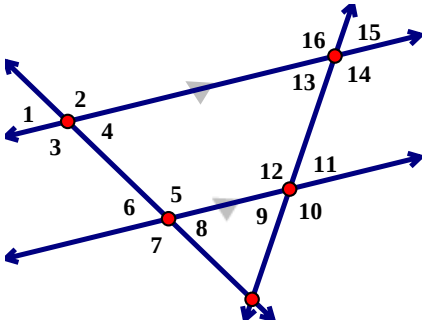
c. If lines are parallel, alternate exterior angles are ≅

d. If lines are parallel, same-side interior angles are supplementary

e. If lines are parallel, same-side exterior angles are supplementary

Examples:

1. Provide the name of the following relationships.



a) ∠1 & ∠6 Corr ∠'s

b) ∠2 & ∠7 Alt. ext. ∠'s

c) ∠16 & ∠14 Vertical ∠'s

d) ∠14 & ∠11 s-s int ∠'s

e) ∠1 & ∠7 s-s ext ∠'s

f) ∠6 & ∠5 Supp/linear pair

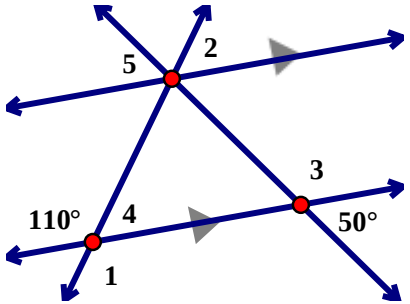
g) ∠15 & ∠10 s-s ext ∠'s

h) ∠1 & ∠2 Supp/linear pair

i) ∠13 & ∠12 s-s int ∠'s

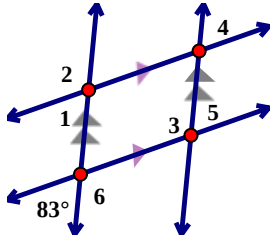
j) ∠16 & ∠9 s-s ext ∠'s

2. Find the measure of the angle and give a reason for knowing it.



	(measure)	(reason)		(measure)	(reason)
a) m∠1 =	110°	Vert ∠'S thm	b) m∠2 =	70°	s-s ext ∠'s Supp/180°
c) m∠3 =	130°	Supp/linear pair	d) m∠4 =	70°	Supp/linear pair
e) m∠5 =	50°	Alt. ext. ∠'s			

3. Find the measure of the angle.



a) m∠1 = 83°

b) m∠2 = 97°

c) m∠3 = 97°

d) m∠4 = 83°

e) m∠5 = 83°

f) m∠6 = 97°