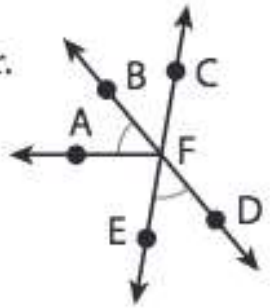
Worksheet Answers

- 1. a = 60, b = 120, c = 120
- 2. a = 90, b = 90, c = 50
- 3. a = 77, b = 52, c = 77, d = 51
- 4. a = 60, b = 120, c = 120, d= 115, e = 65,
  f =115, g = 125, h =55, I =125
- 5. a = 90, b = 163, c = 17, d = 110, e = 70
- 6. They should add up to 180 degrees.

Given: $m\angle AFB = m\angle EFD = 50°$

Points B, F, D and points E, F, C are collinear.



1. Determine whether each pair of angles is a pair of vertical angles, a linear pair of angles, or neither. Select the correct answer for each lettered part.

A. $\angle BFC$ and $\angle DFE$	● Vertical	○ Linear Pair	○ Neither
B. $\angle BFA$ and $\angle DFE$	○ Vertical	○ Linear Pair	● Neither
C. $\angle BFC$ and $\angle CFD$	○ Vertical	● Linear Pair	○ Neither
D. $\angle AFE$ and $\angle AFC$	○ Vertical	● Linear Pair	○ Neither
E. $\angle BFE$ and $\angle CFD$	● Vertical	○ Linear Pair	○ Neither
F. $\angle AFE$ and $\angle BFC$	○ Vertical	○ Linear Pair	● Neither

2. Find m∠*AFE*.

m∠*AFB* + m∠*AFE* + m∠*EFD* = 180°

50° + m∠*AFE* + 50° = 180°

m∠*AFE* = 80°

3. Find m∠*DFC*.

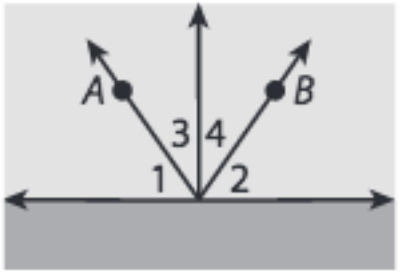
m∠*EFB* = m∠*AFB* + m∠*AFE* = 80° + 50° = 130°

m∠*DFC* = m∠*EFB*, so m∠*DFC* = 130°

4. Find m∠*BFC*.

m∠*BFC* = m∠*EFD* = 50°

5. **Represent Real-World Problems** A sprinkler swings back and forth between *A* and *B* in such a way that ∠1 ≅ ∠2, ∠1 and ∠3 are complementary, and ∠2 and ∠4 are complementary. If m∠1 = 47.5°, find m∠2, m∠3, and m∠4.



∠1 ≅ ∠2, so m∠2 = 47.5°

∠1 and ∠3 are complementary, so m∠3 = 90 − 47.5 = 42.5°

∠2 and ∠4 are complementary, so m∠4 = 90 − 47.5 =42.5°

6. If an angle is acute, then the measure of its complement must be greater than the measure of its supplement.

False. The measure of an acute angle is less than 90°, so the measure of its complement will be less than 90° and the measure of its supplement will be greater than 90°. So, the measure of the supplement will be greater than the measure of the complement.

7. A pair of vertical angles may also form a linear pair.

False. Vertical angles do not share a common side.

8. If two angles are supplementary and congruent, the measure of each angle is 90°.

True

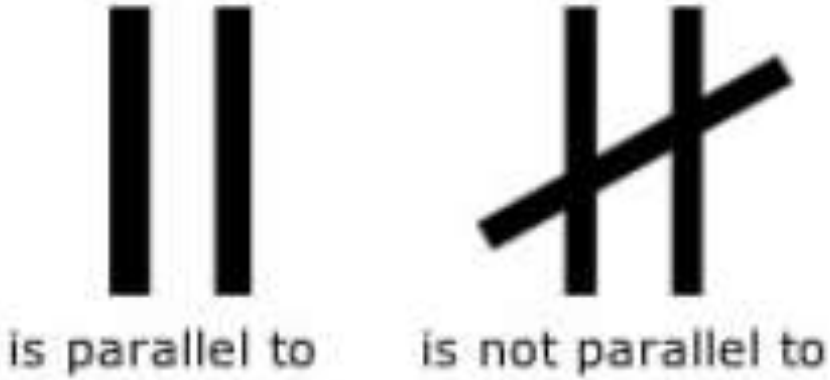
9. If a ray divides an angle into two complementary angles, then the original angle is a right angle.

True

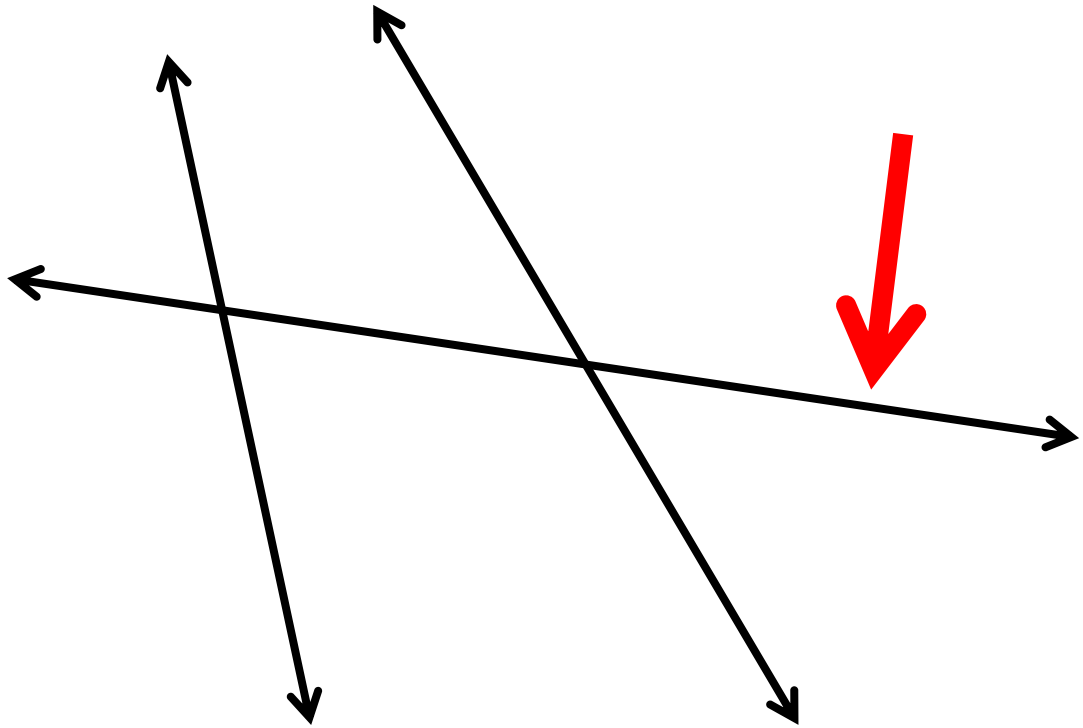
Angles formed by Parallel Lines

Objectives:

- Given one angle measure, find ALL angles formed by 2 parallel lines
- Identify special angle pairs
- Use special angle pair rules to find angle measures

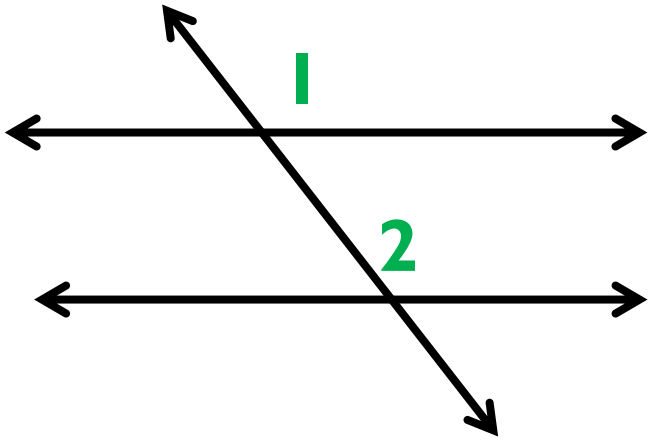


- **<u>TRANSVERSAL:</u>** A line that intersects two coplanar lines.



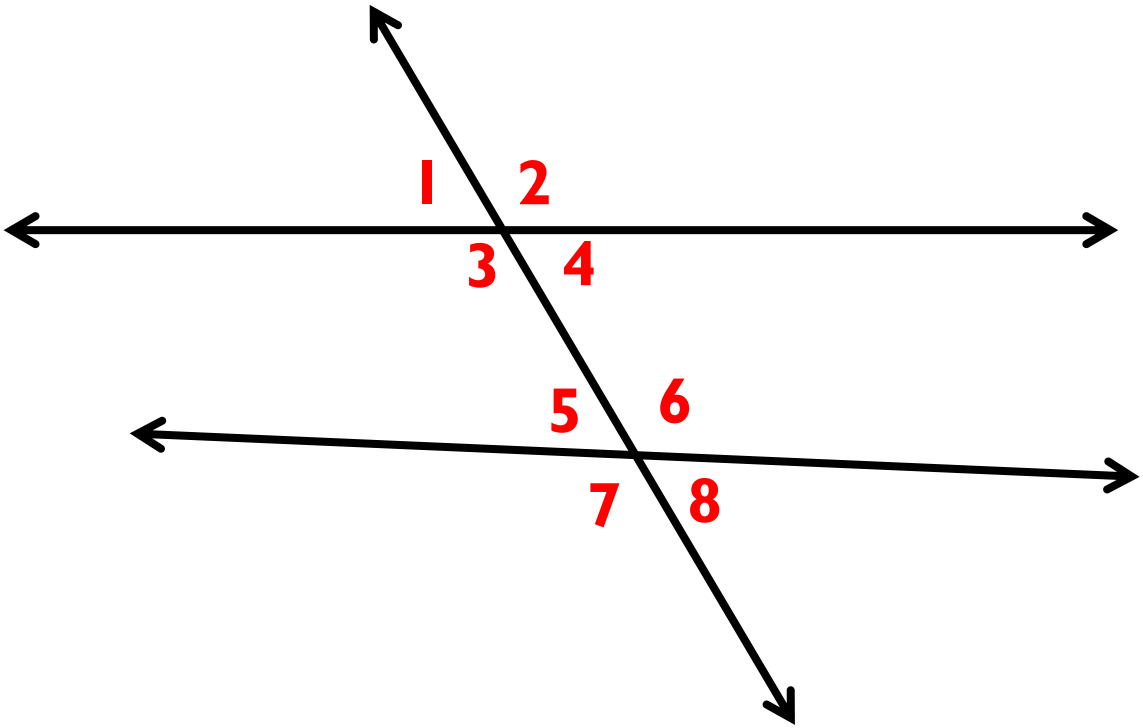
Corresponding Angles

- Two angles that are in the same "position" but on different lines are called **corresponding**.



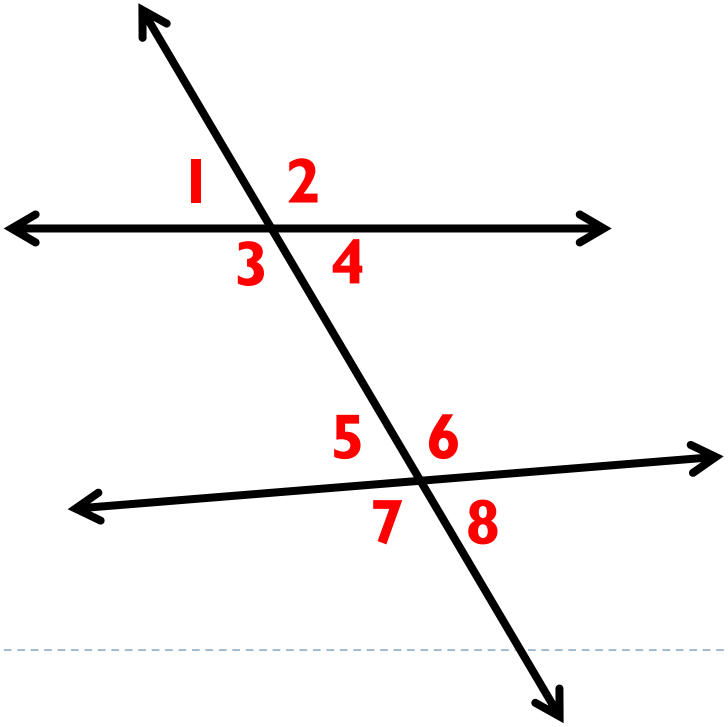
New terminology

- Which angles would you say are **interior** angles?
- Which angles would you say are **exterior** angles?



New terminology

- **Interior: between the lines**
- **Exterior: outside the lines**
- **Alternate: opposite sides of the transversal**
- **Same-side: same side of the transversal**



Give me an example of:

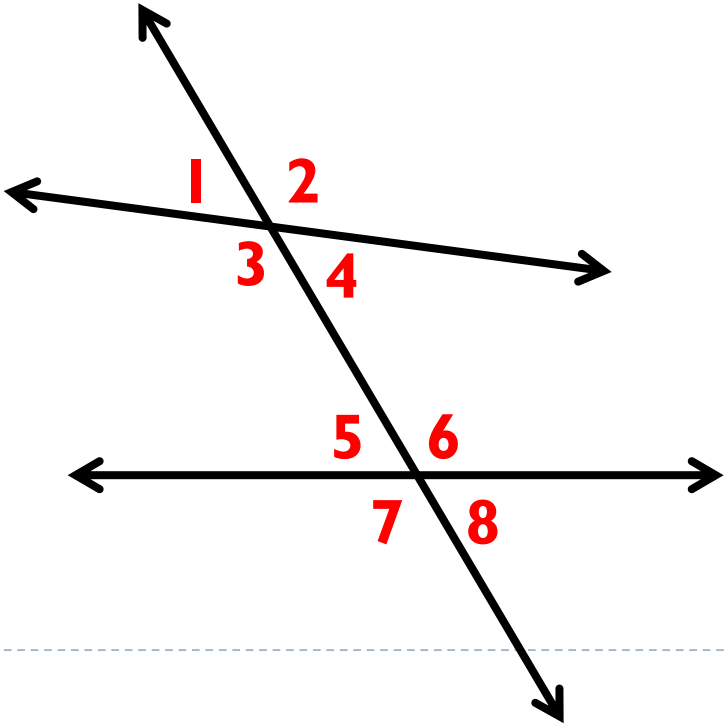
A pair of **alternate interior** angles

A pair of **same-side interior** angles

A pair of **alternate exterior** angles

IN YOUR NOTES!

- **Alternate Interior:** ∠4 and ∠5, ∠3 and ∠6
- **Same-side Interior:** ∠3 and ∠5, ∠4 and ∠6
- **Alternate Exterior:** ∠1 and ∠8, ∠2 and ∠7
- **Corresponding:** ∠1 and ∠5, ∠2 and ∠6, ∠3 and ∠7, ∠4 and ∠8



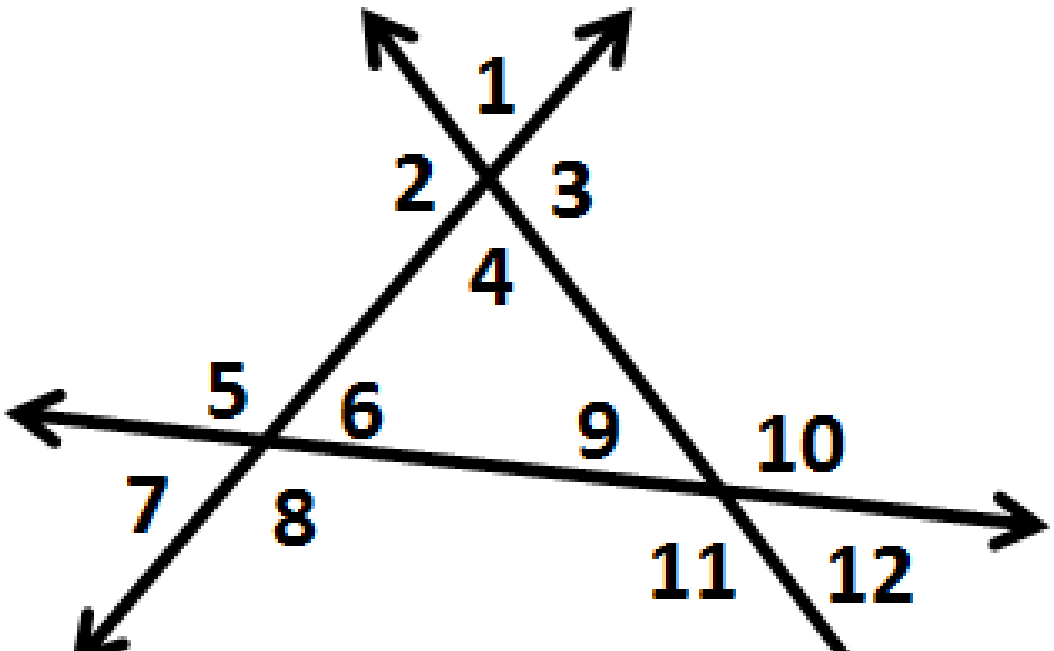
5) For each, identify the type of special angle pair.

a) ∠2 and ∠6

b) ∠7 and ∠11

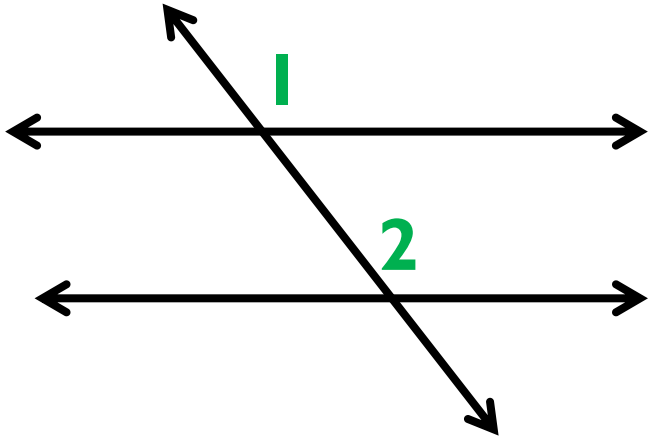
c) ∠4 and ∠9

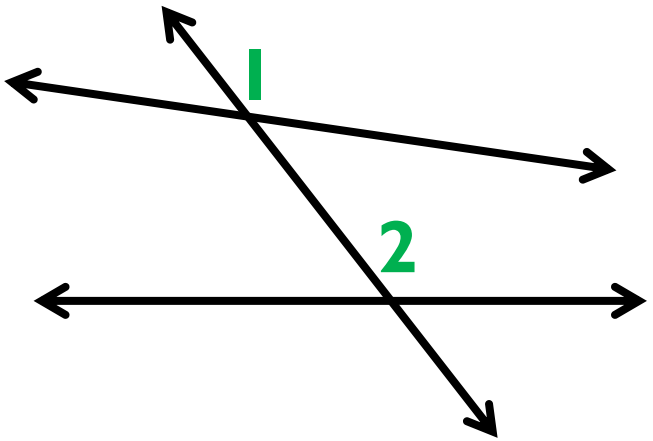
d) ∠1 and ∠11



Corresponding Angles

- If the lines are parallel, corresponding angles will be congruent!!!

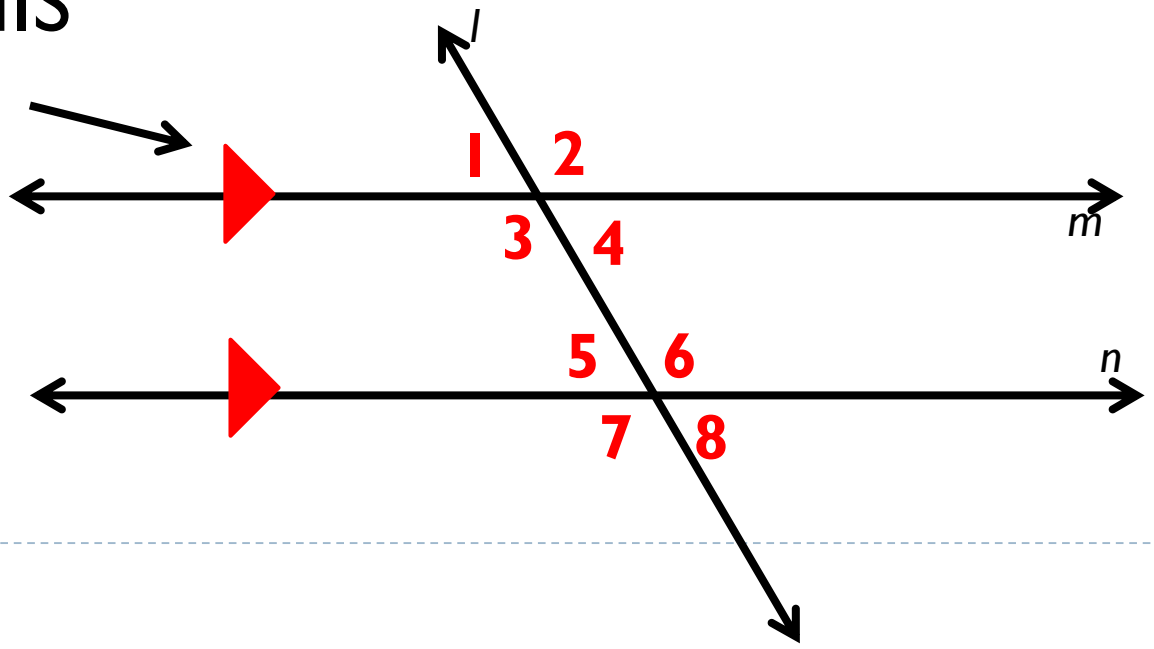




DISCUSS WITH YOUR GROUP:

- ***If lines m and n are parallel,*** which angles are congruent to each other?
- Discuss in groups:
  - Which angles do you think are congruent?
  - Why do you think they are congruent?
  - Does your group all agree or not?

WHAT IS THIS SYMBOL????



- Same Side Interior Angles Postulate:
  - If two parallel lines are cut by a transversal, then the pairs of same-side interior angles are supplementary

- Corresponding Angles Theorem
  - If two parallel lines are cut by a transversal, then the pairs of corresponding angles have the same measure

- Alternate Interior Angles Theorem:
  - If two parallel lines are cut by a transversal, then the pairs of alternate interior angles have the same measure

- Alternate Exterior Angles Theorem:
  - If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles have the same measure

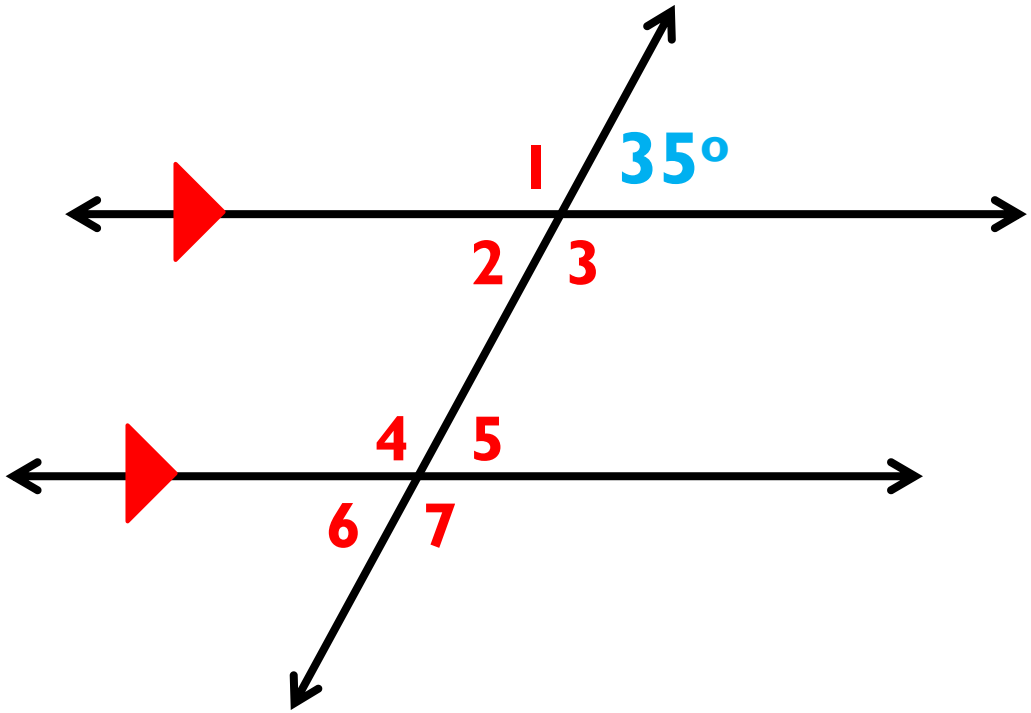
IN YOUR BINDER

- **IF THE LINES ARE PARALLEL:**
  - Alternate Interior: congruent
  - Alternate Exterior: congruent
  - Same-side Interior: supplementary

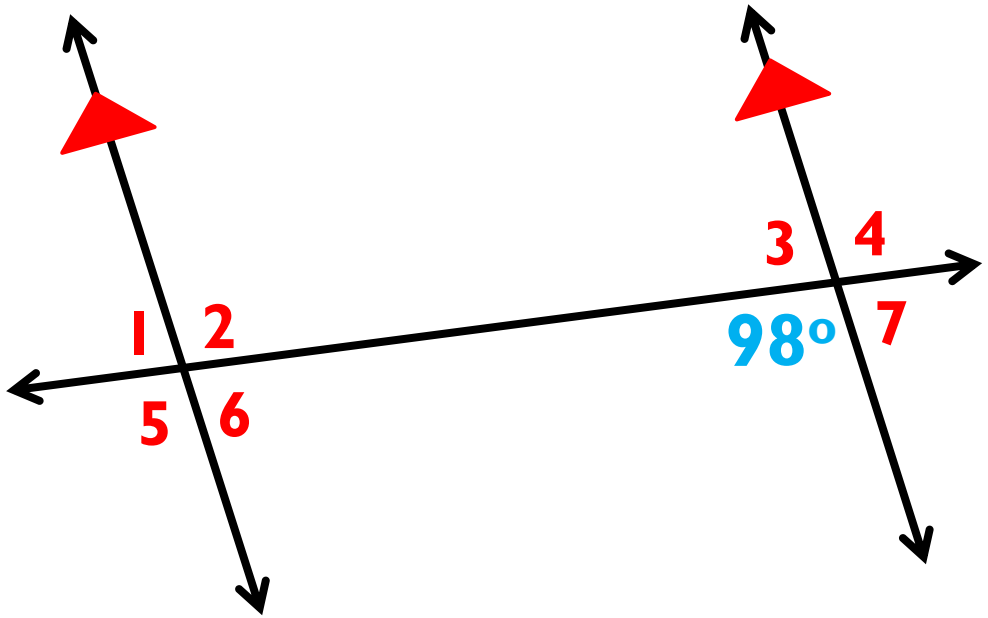
Whiteboard Practice

You can always refer back to these slides on my website

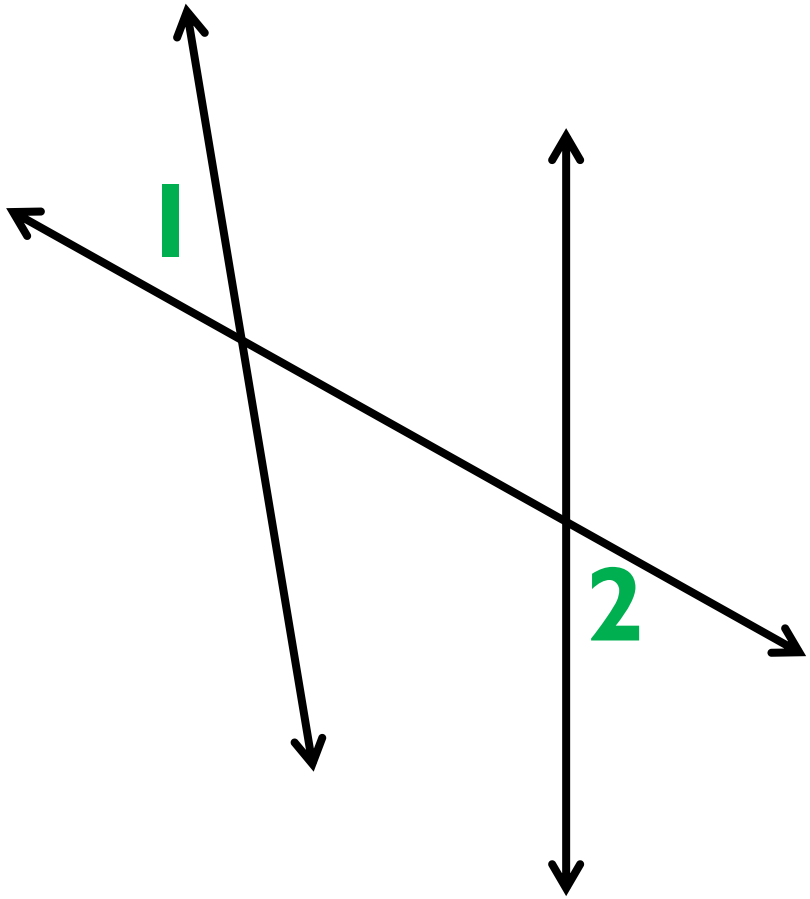
- One angle measure is given. Find the measures of **ALL** other angles.



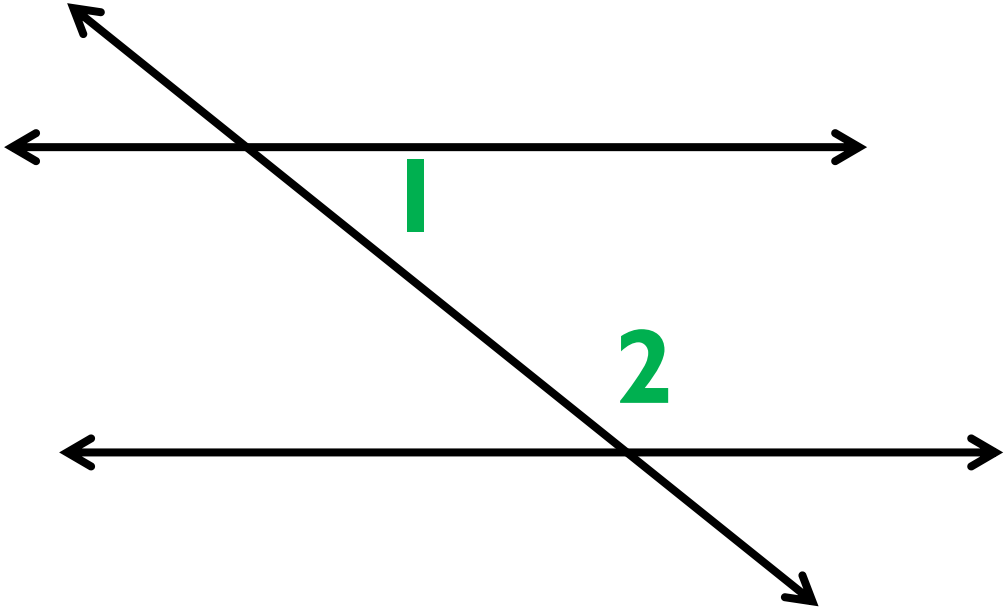
- One angle measure is given. Find the measures of **ALL** other angles.



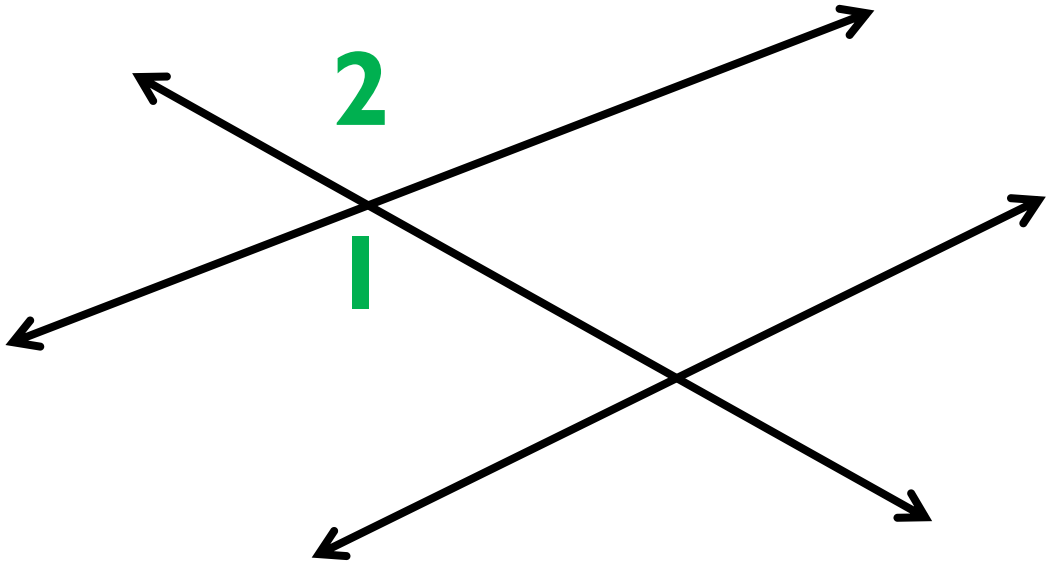
Which type of angle?



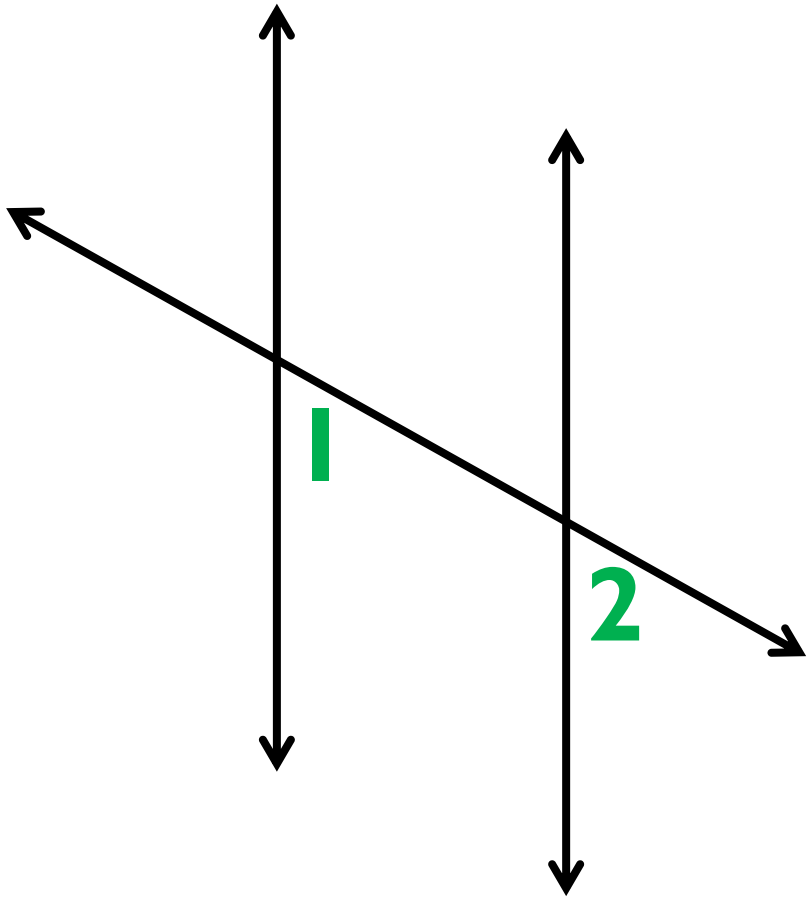
Which type of angle?



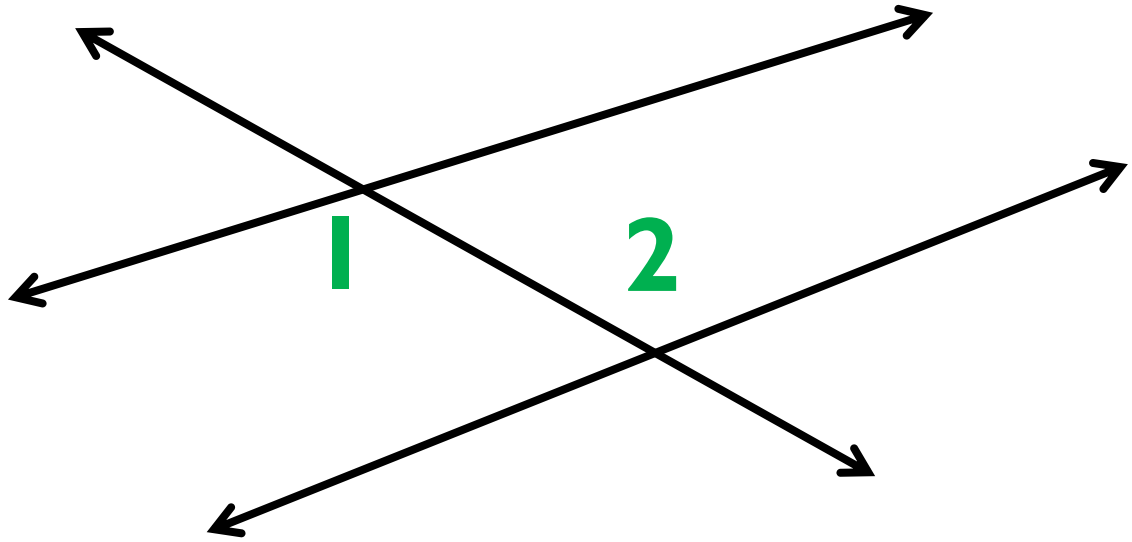
Which type of angle?



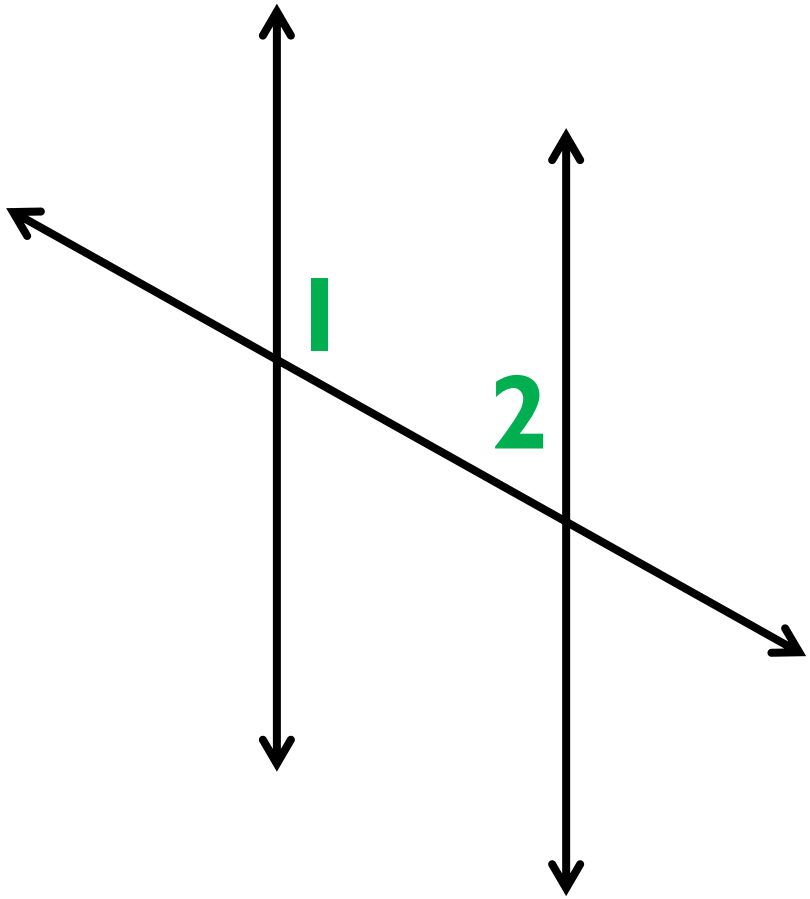
Which type of angle?



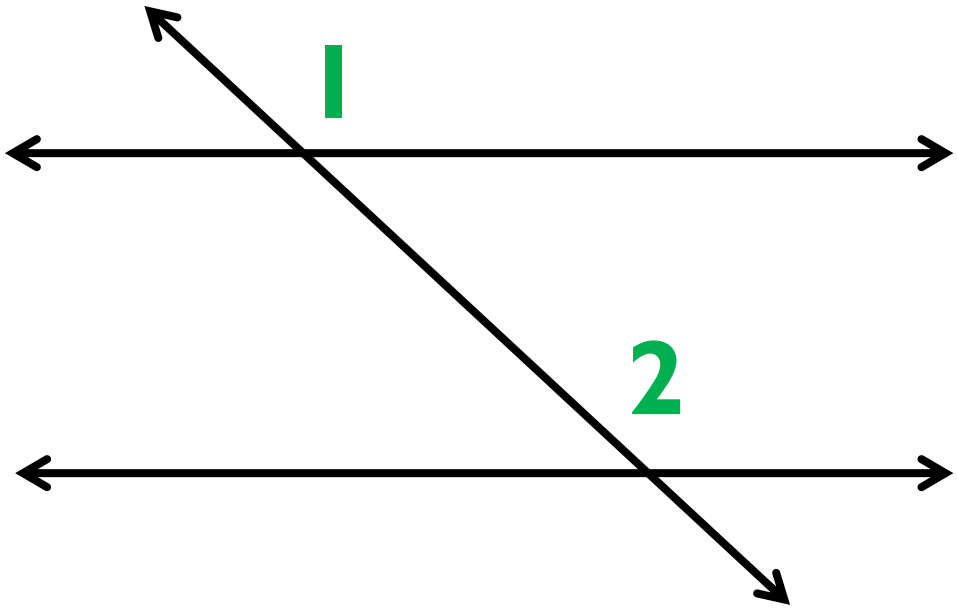
Which type of angle?



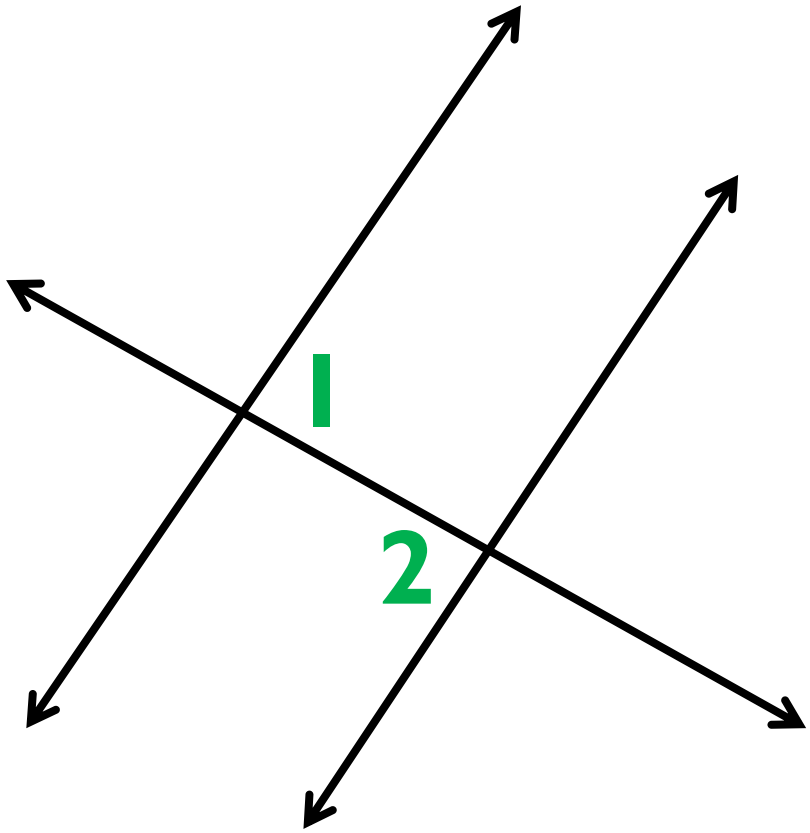
Which type of angle?



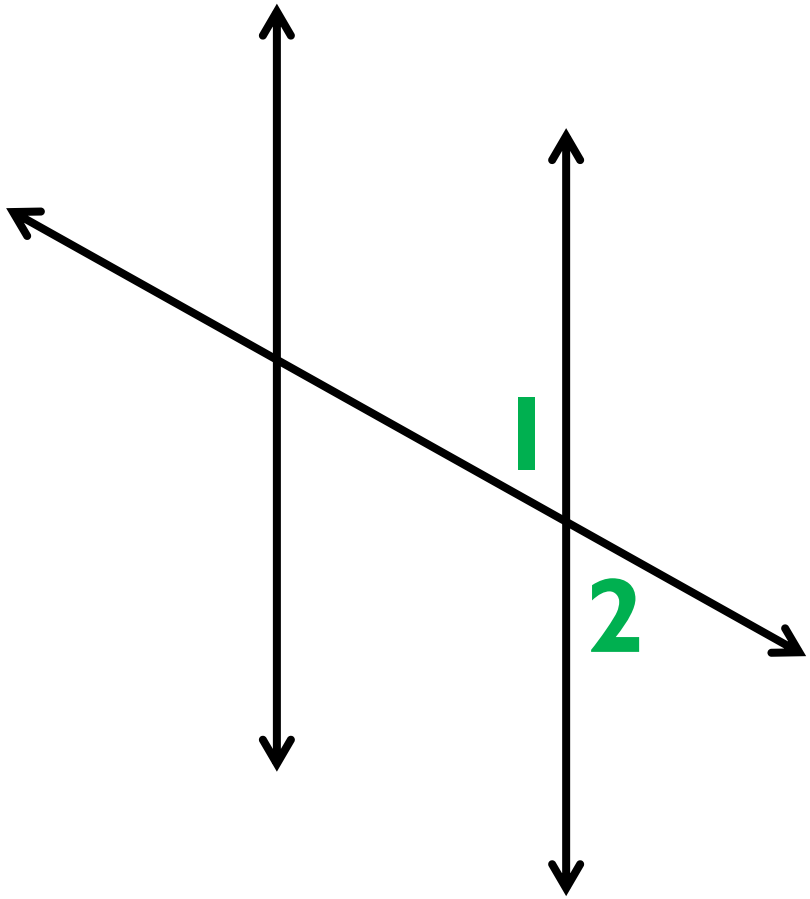
Which type of angle?



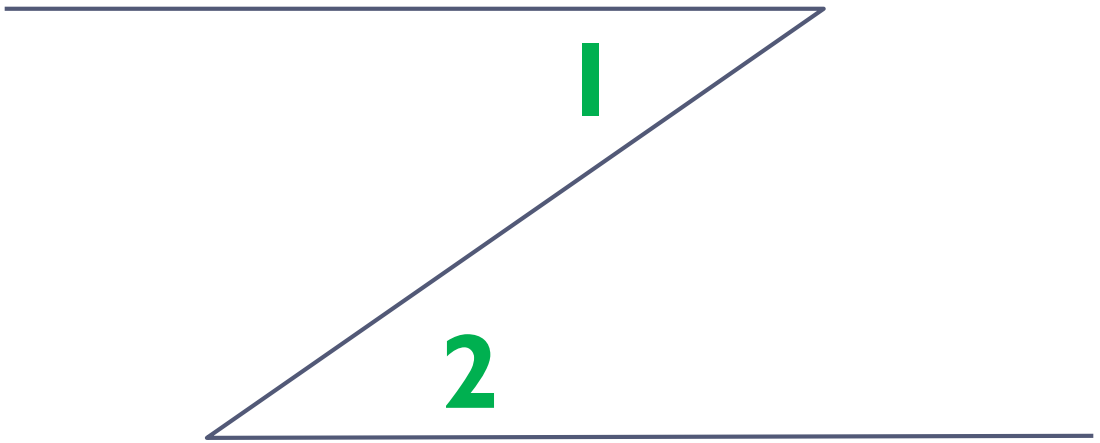
Which type of angle?



Which type of angle?

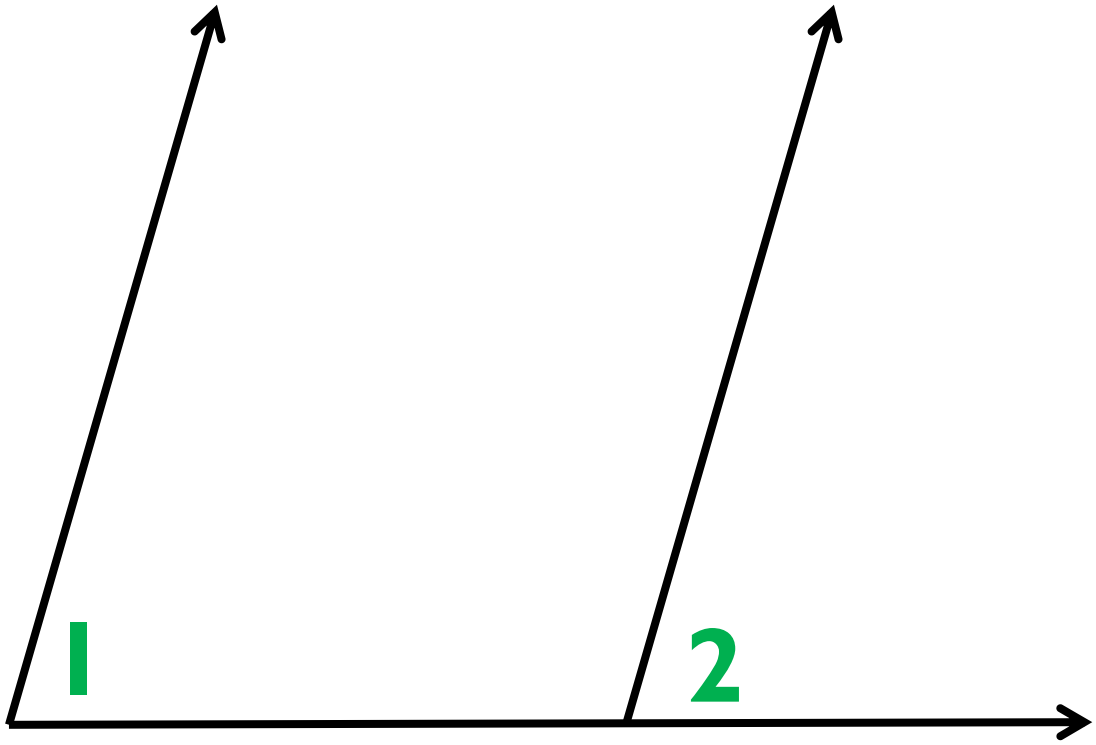


Which type of angle?



Which type of angle?

Corresponding

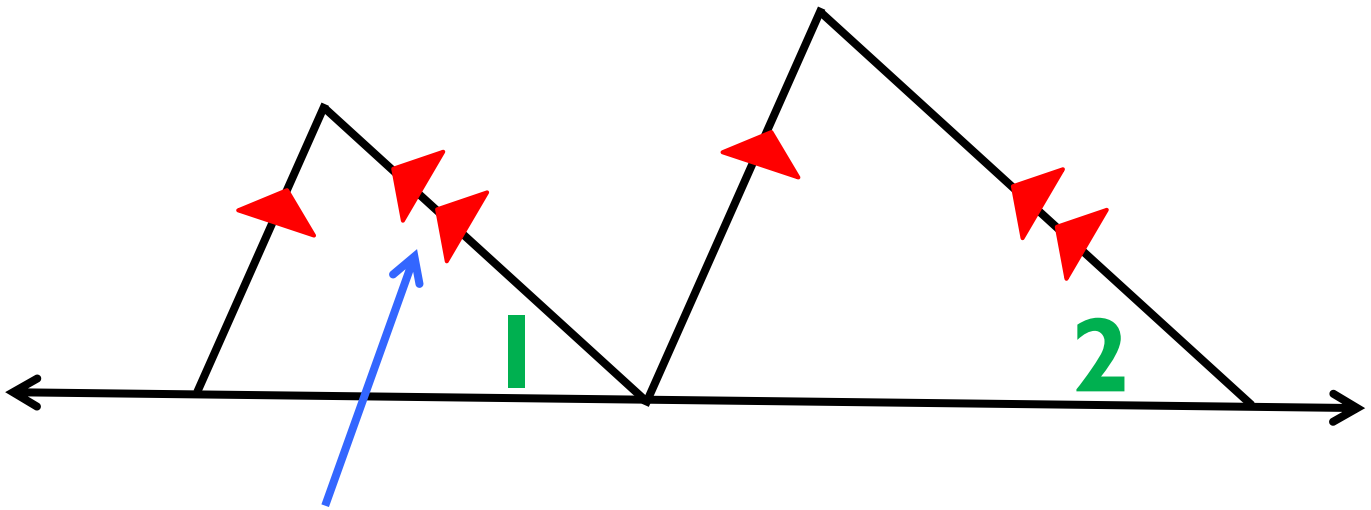


Which type of angle?

Same-side interior

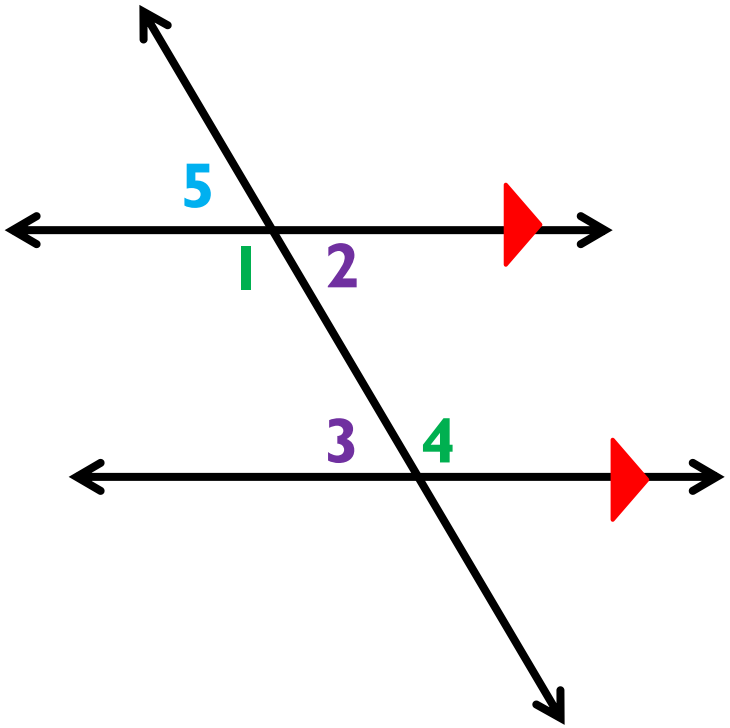
Which type of angle?

Corresponding



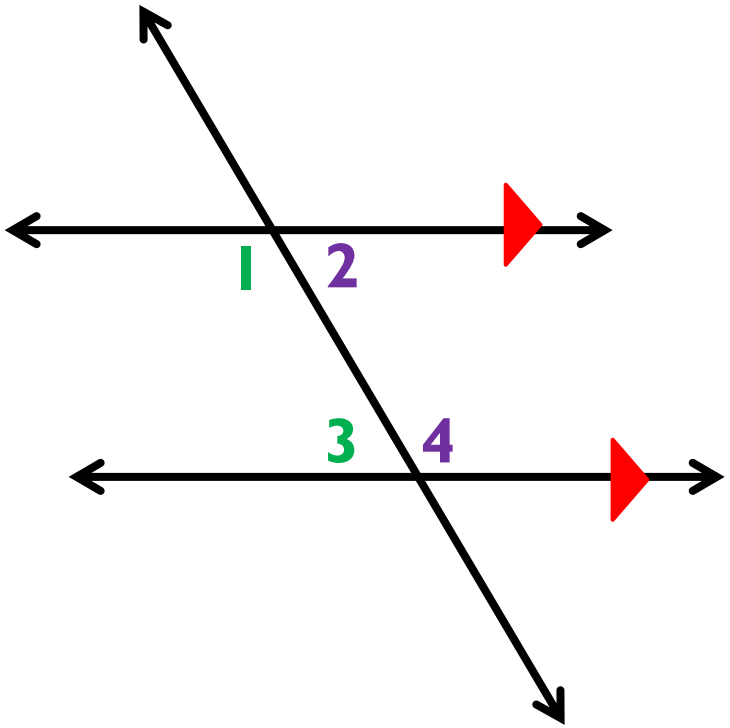
WHY ARE THERE TWO ARROWS???

- What is **ALWAYS** true about alternate interior angles when two parallel lines are cut by a transversal?



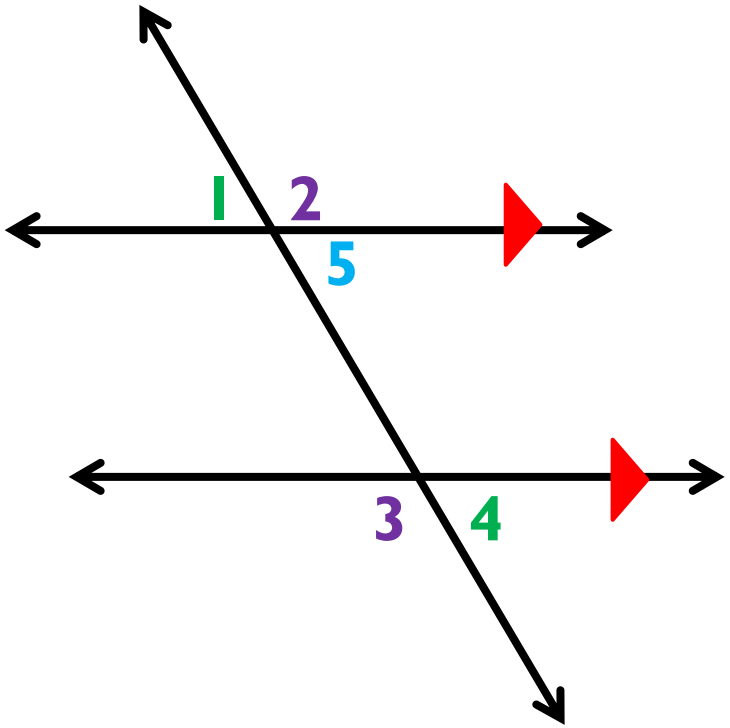
They are congruent

- What is **ALWAYS** true about same-side interior angles when two parallel lines are cut by a transversal?



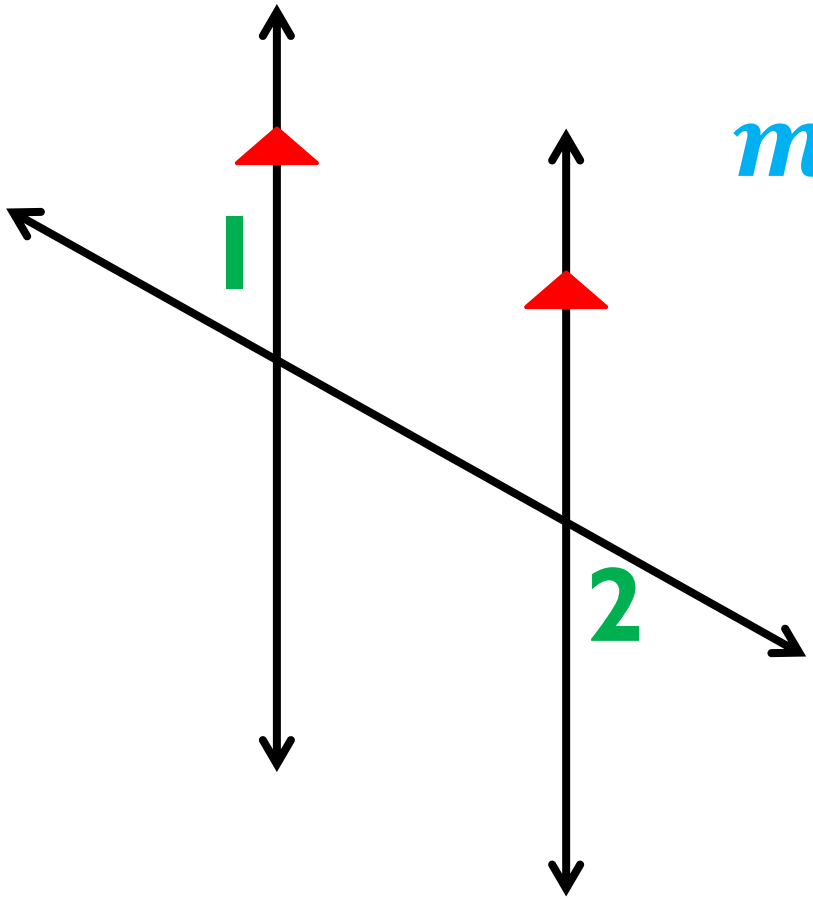
They are supplementary

- What is **ALWAYS** true about alternate exterior angles when two parallel lines are cut by a transversal?



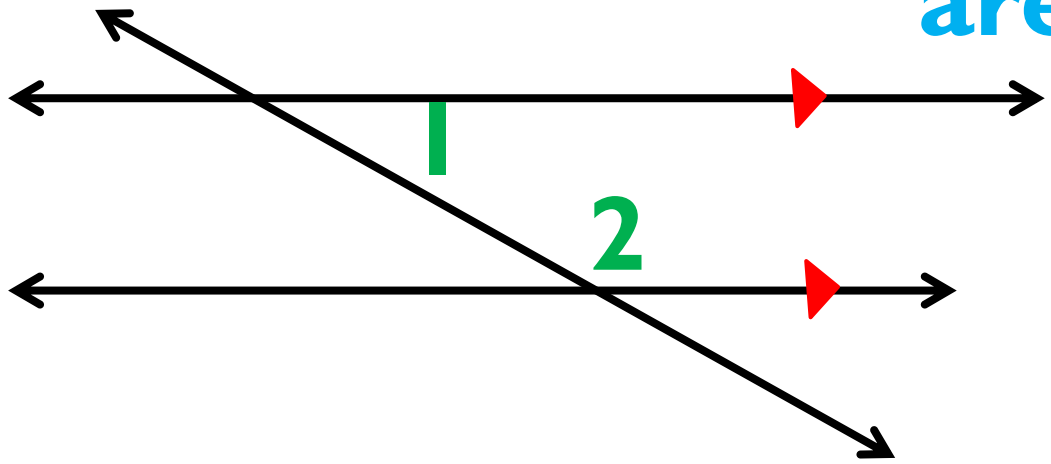
They are congruent

If the measure of angle 1 is 30 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



$m\angle 2 = 30^o$; they are alternate exterior

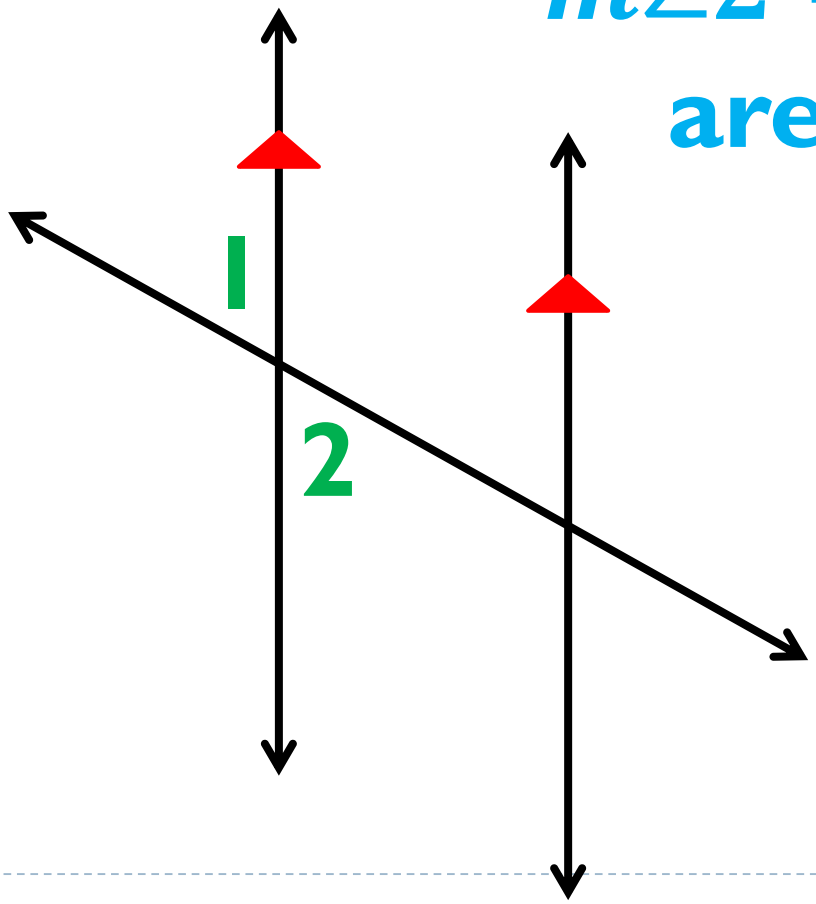
If the measure of angle 1 is 45 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



$m\angle 2 = 135^o$; they are same-side interior

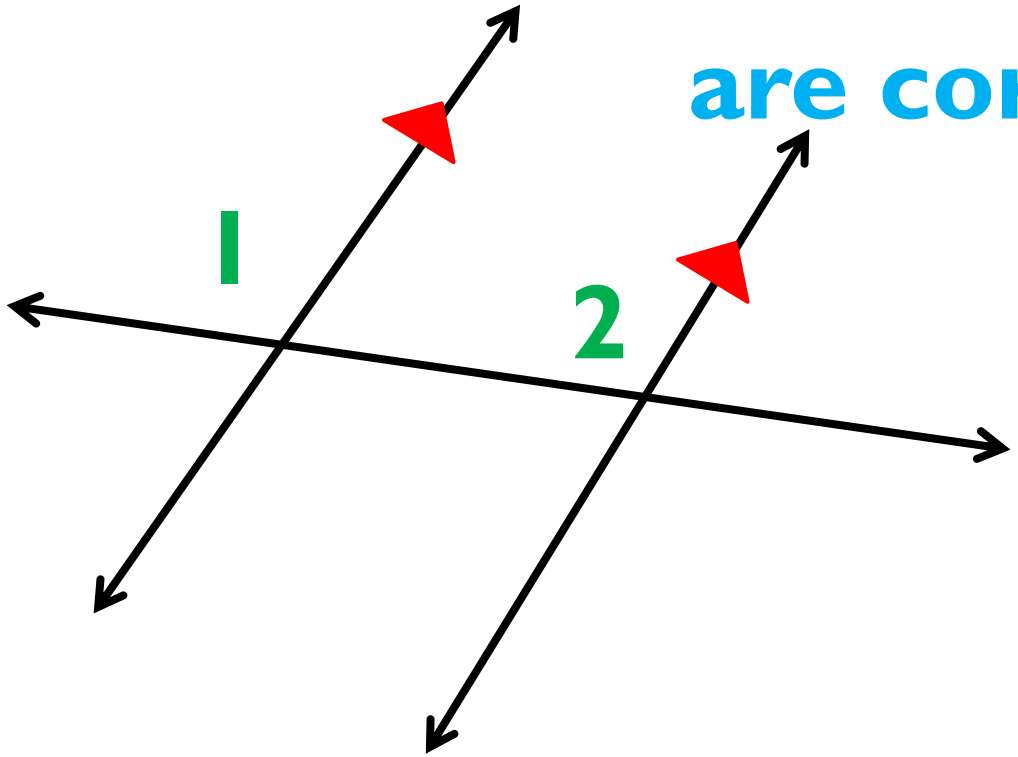
If the measure of angle 1 is 25 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

$m\angle 2 = 25^o$; they are vertical



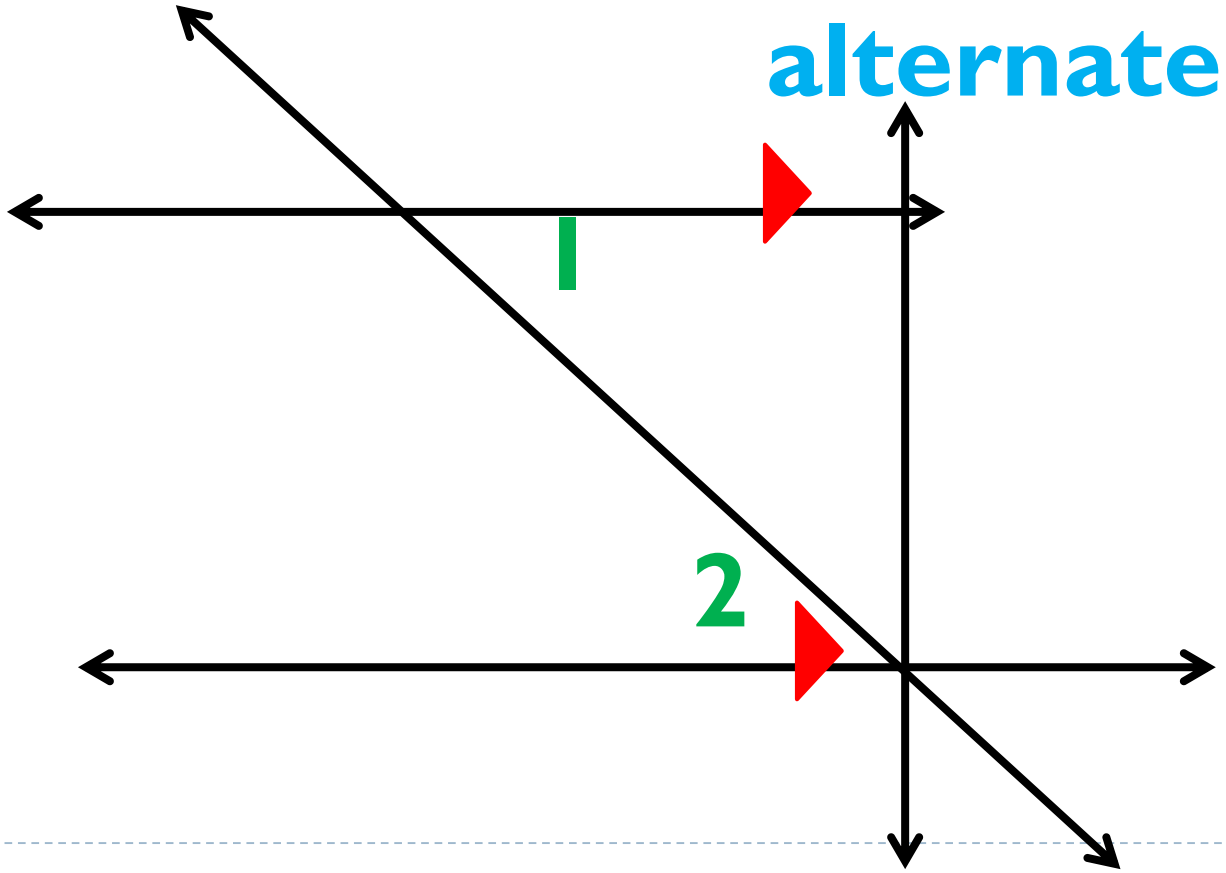
If the measure of angle 1 is 115 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

$m\angle 2 = 115^o$; they are corresponding

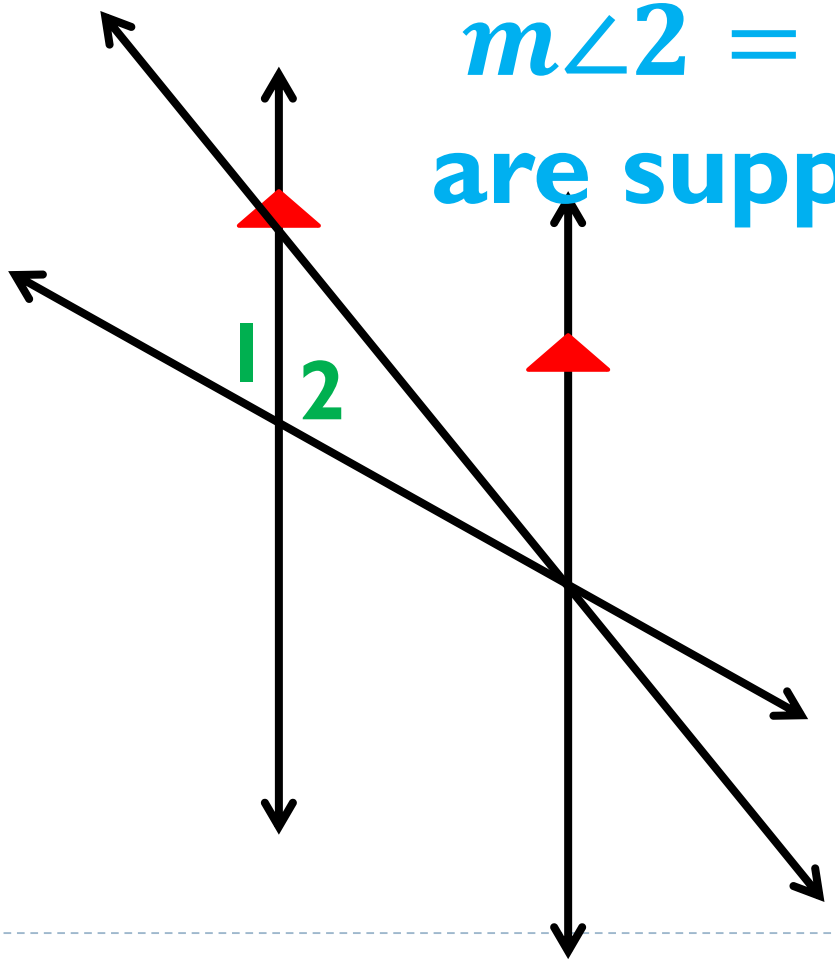


If the measure of angle 1 is 47 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

$m\angle 2 = 47^o$; they are alternate interior

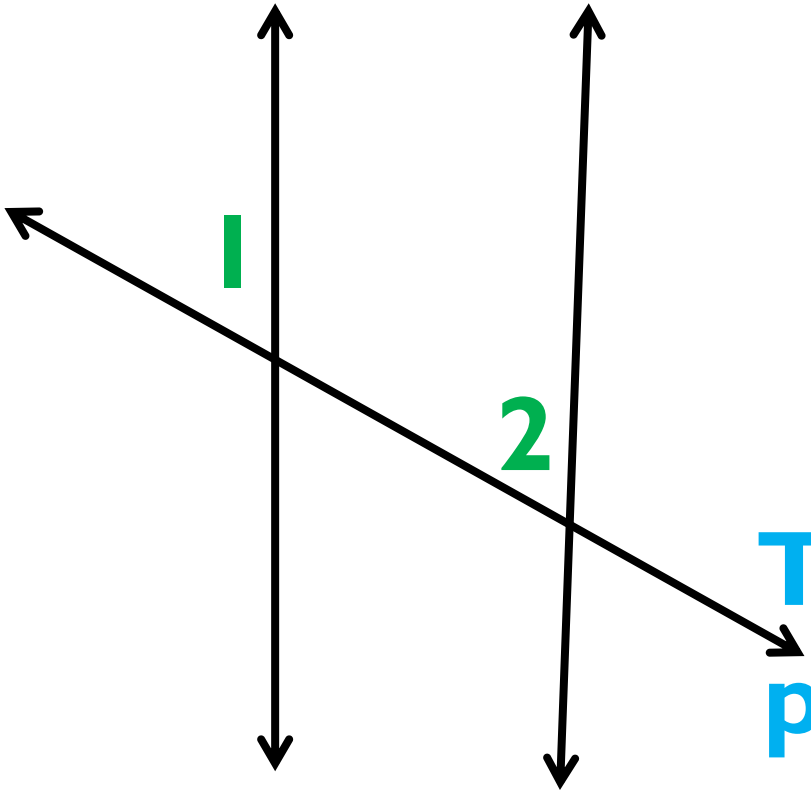


If the measure of angle 1 is 41 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



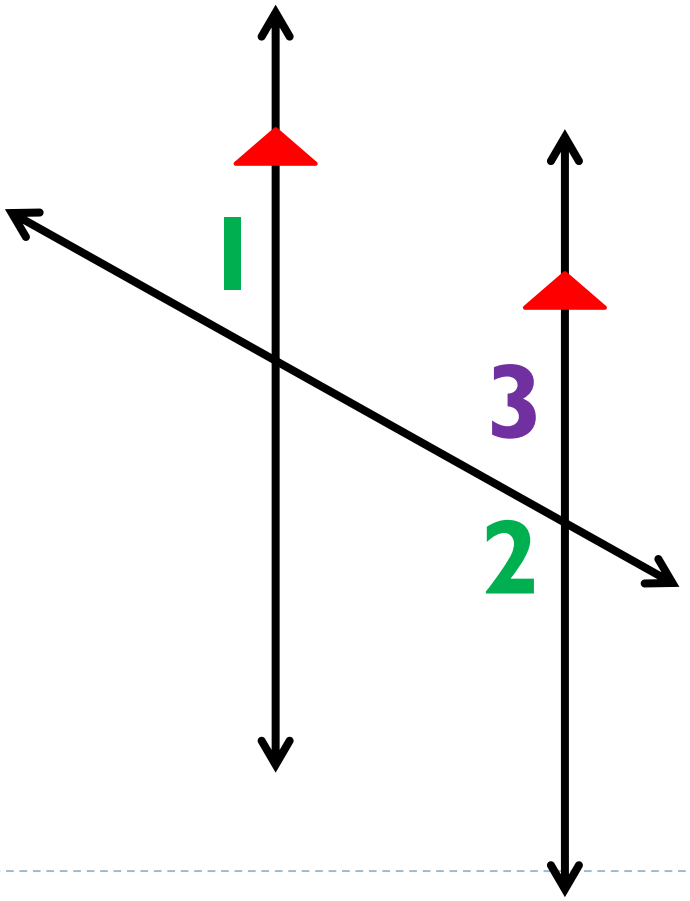
$m\angle 2 = 139^o$; they are supplementary

If the measure of angle 1 is 41 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



TRICK QUESTION: These lines aren't parallel. We don't know!

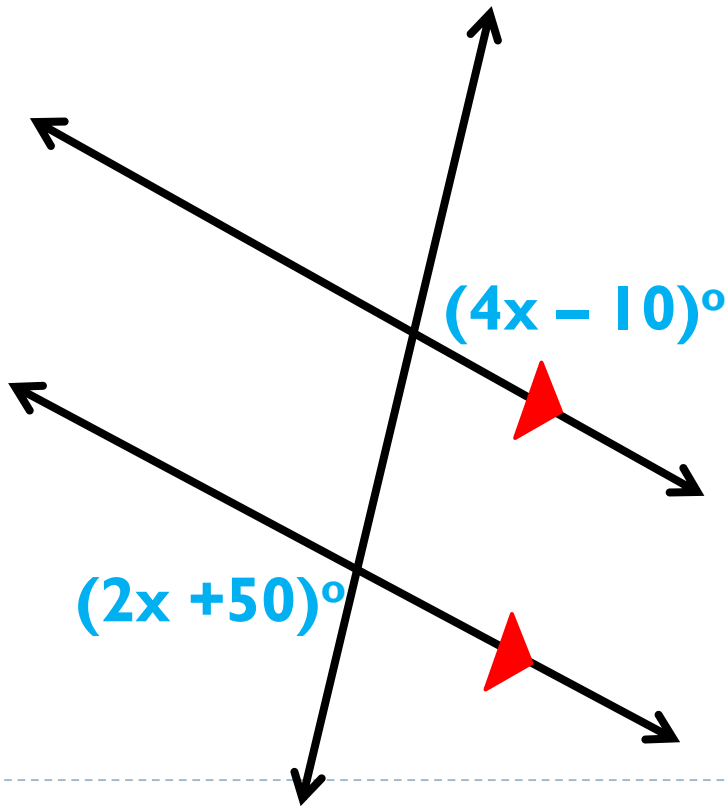
If the measure of angle 1 is 40 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



$m\angle 2 = 140^o$; angle 3 is 40 degrees because it corresponds to angle 1; angle 2 is supplementary with angle 3

With algebra…

- Find the value of x.



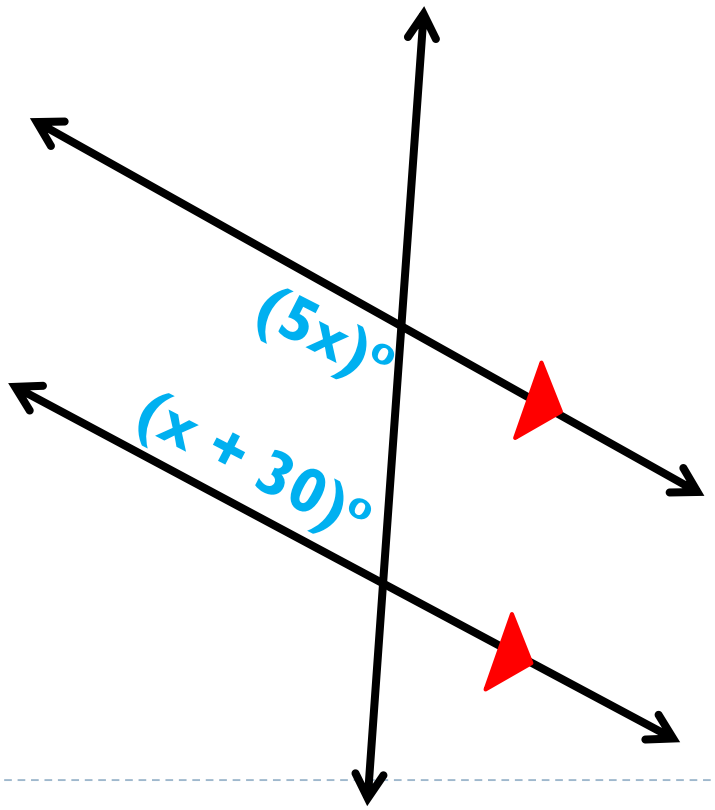
Alt. Ext: congruent

$2x + 50 = 4x - 10$

$x = 30$

With algebra…

- Find the measure of both angles.



Same-side interior: supplementary

$(5x) + (x + 30) = 180$

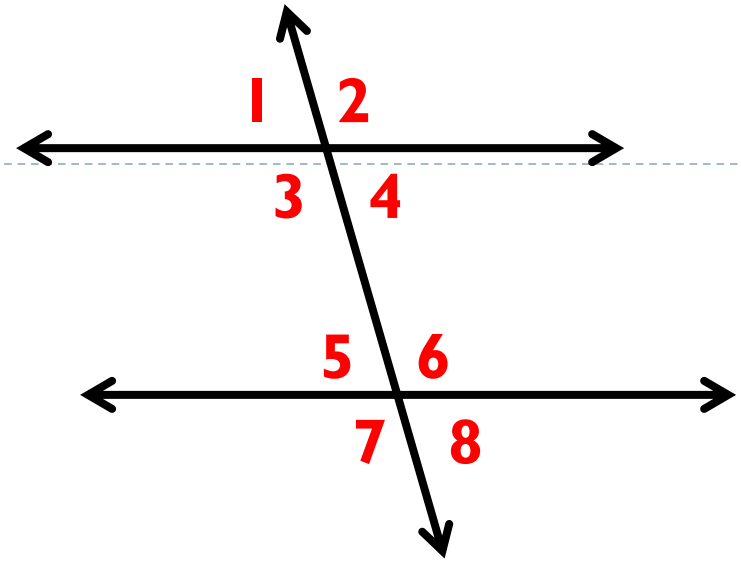
$6x + 30 = 180$

$x = 25$

$55°, 125°$

Exit Ticket

- Don't forget your name
- Hold it up when done



1) If $\mathrm{m}\angle 1 = 84^o$, find the measure of ALL other angles.
2) If $\mathrm{m}\angle 3 = 112^o$, find the measure of angle 6.
3) If $\mathrm{m}\angle 5 = 80^o$, find the measure of angle 3.
4) Angle 4 and angle 8 are _____ angles.
5) Angle 2 and angle 7 are _____ angles.

Homework

- Worksheet