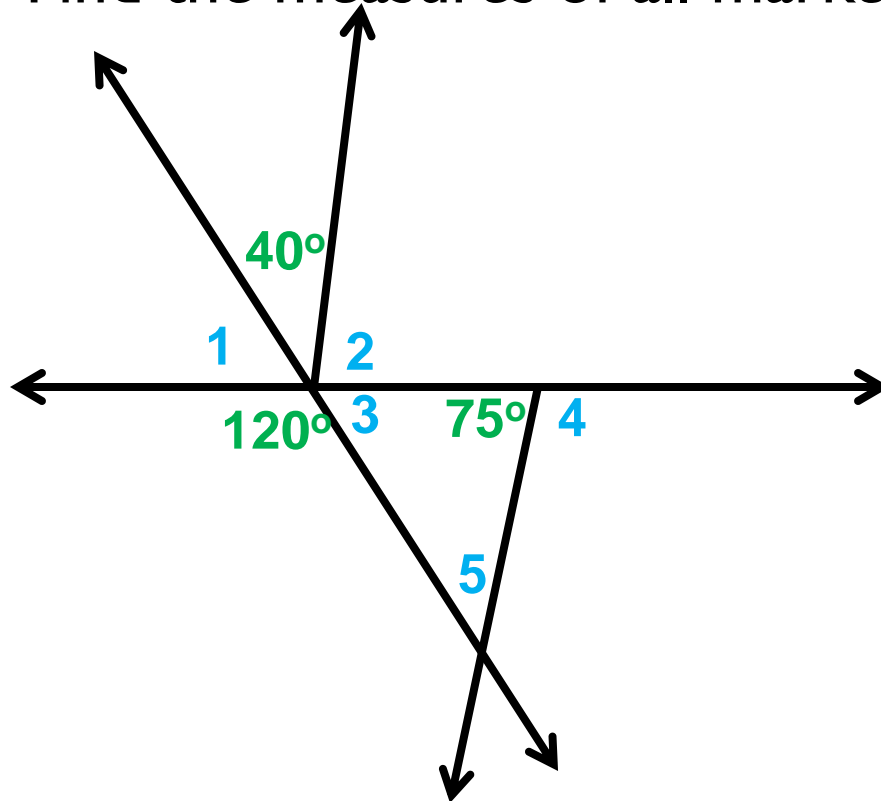


Warm Up 2/(#of sides in a heptagon)

*****GET A WHITEBOARD (For later)*****

- I. Find the measures of all marked angles in the diagram.



Grade the 2 parts of the homework together
as ONE GRADE



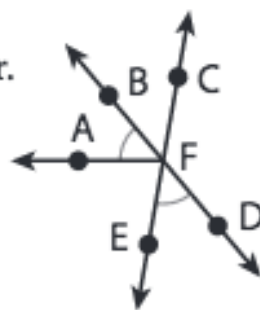
Worksheet Answers

- ▶ 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: $m\angle AFB = m\angle EFD = 50^\circ$

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 $\angle DFE$	<input checked="" type="radio"/> Vertical	<input type="radio"/> Linear Pair	<input type="radio"/> Neither
B. $\angle BFA$ and $\angle DFE$	<input type="radio"/> Vertical	<input type="radio"/> Linear Pair	<input checked="" type="radio"/> Neither
C. $\angle BFC$ and $\angle CFD$	<input type="radio"/> Vertical	<input checked="" type="radio"/> Linear Pair	<input type="radio"/> Neither
D. $\angle AFE$ and $\angle AFC$	<input type="radio"/> Vertical	<input checked="" type="radio"/> Linear Pair	<input type="radio"/> Neither
E. $\angle BFE$ and $\angle CFD$	<input checked="" type="radio"/> Vertical	<input type="radio"/> Linear Pair	<input type="radio"/> Neither
F. $\angle AFE$ and $\angle BFC$	<input type="radio"/> Vertical	<input type="radio"/> Linear Pair	<input checked="" type="radio"/> Neither

2. Find $m\angle AFE$.

$$m\angle AFB + m\angle AFE + m\angle EFD = 180^\circ$$

$$50^\circ + m\angle AFE + 50^\circ = 180^\circ$$

$$m\angle AFE = 80^\circ$$

3. Find $m\angle DFC$.

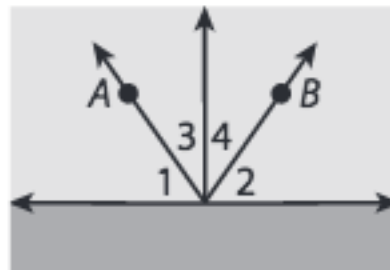
$$m\angle EFB = m\angle AFB + m\angle AFE = 80^\circ + 50^\circ = 130^\circ$$

$$m\angle DFC = m\angle EFB, \text{ so } m\angle DFC = 130^\circ$$

4. Find $m\angle BFC$.

$$m\angle BFC = m\angle EFD = 50^\circ$$

5. **Represent Real-World Problems** A sprinkler swings back and forth between A and B in such a way that $\angle 1 \cong \angle 2$, $\angle 1$ and $\angle 3$ are complementary, and $\angle 2$ and $\angle 4$ are complementary. If $m\angle 1 = 47.5^\circ$, find $m\angle 2$, $m\angle 3$, and $m\angle 4$.



$$\angle 1 \cong \angle 2, \text{ so } m\angle 2 = 47.5^\circ$$

$$\angle 1 \text{ and } \angle 3 \text{ are complementary, so } m\angle 3 = 90 - 47.5 = 42.5^\circ$$

$$\angle 2 \text{ and } \angle 4 \text{ are complementary, so } m\angle 4 = 90 - 47.5 = 42.5^\circ$$

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

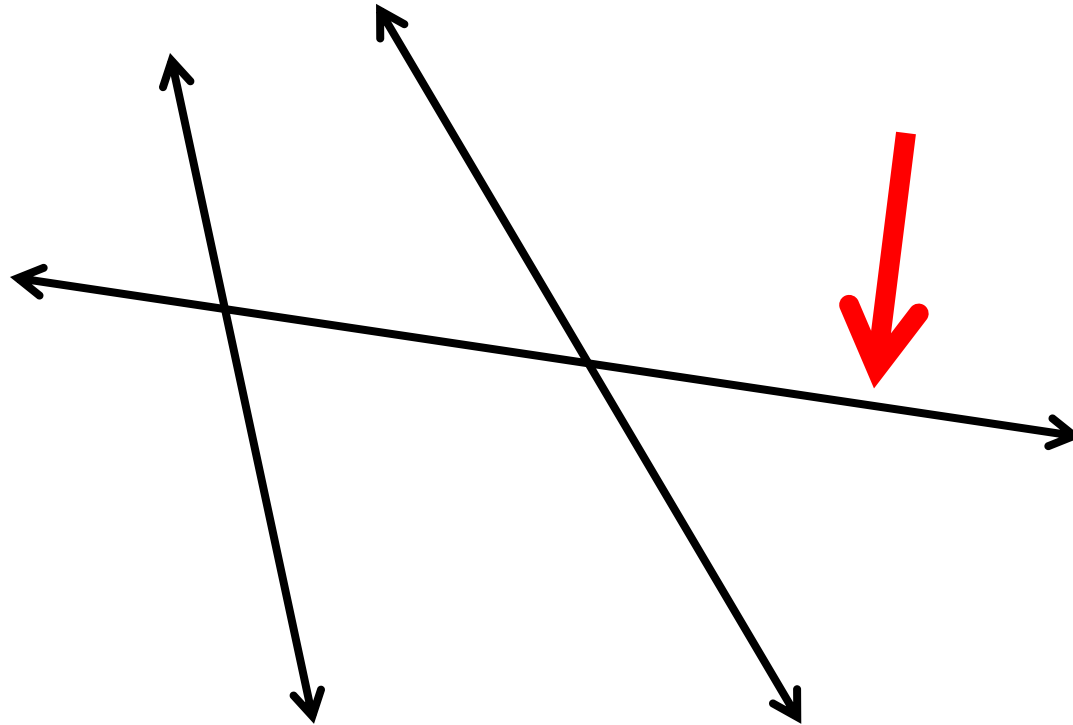


Angles formed by Parallel Lines

Objectives:

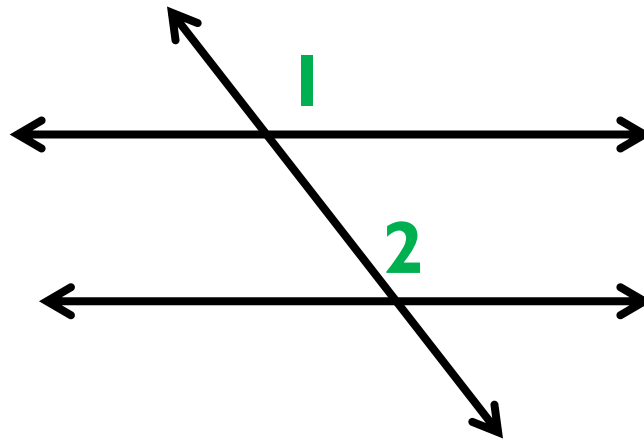
- ▶ Given one angle measure, find ALL angles formed by 2 parallel lines
- ▶ Identify special angle pairs
- ▶ Use special angle pair rules to find angle measures

-
- ▶ **TRANSVERSAL**: A line that intersects two coplanar lines.



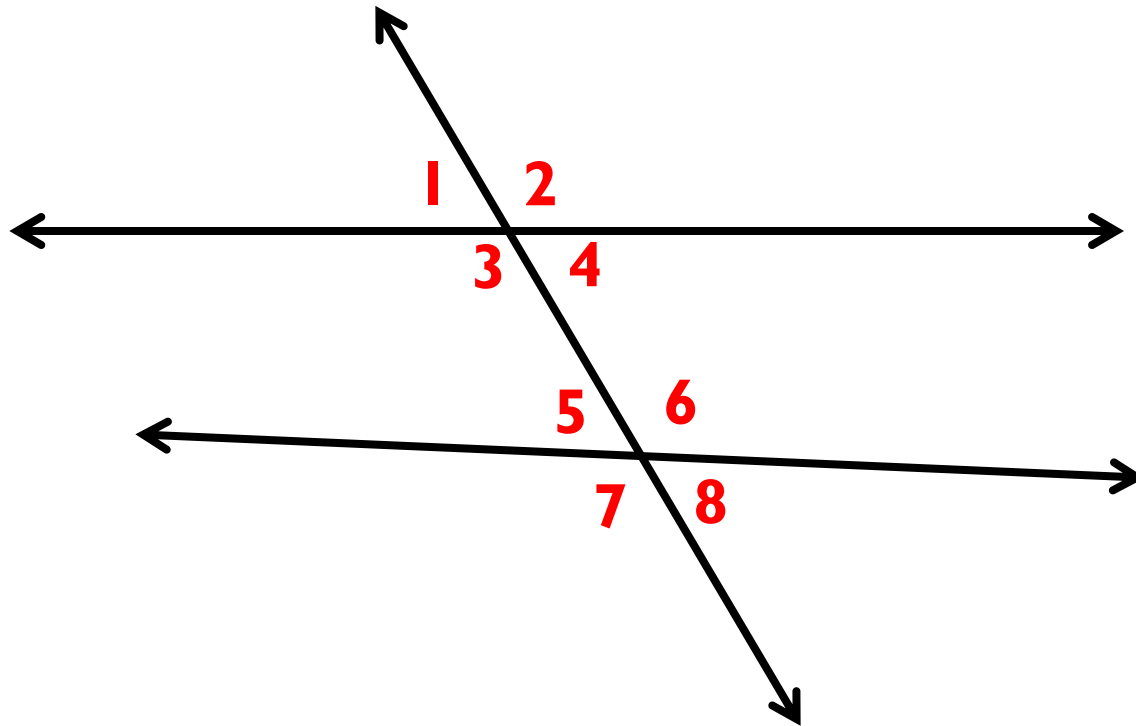
Corresponding Angles

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



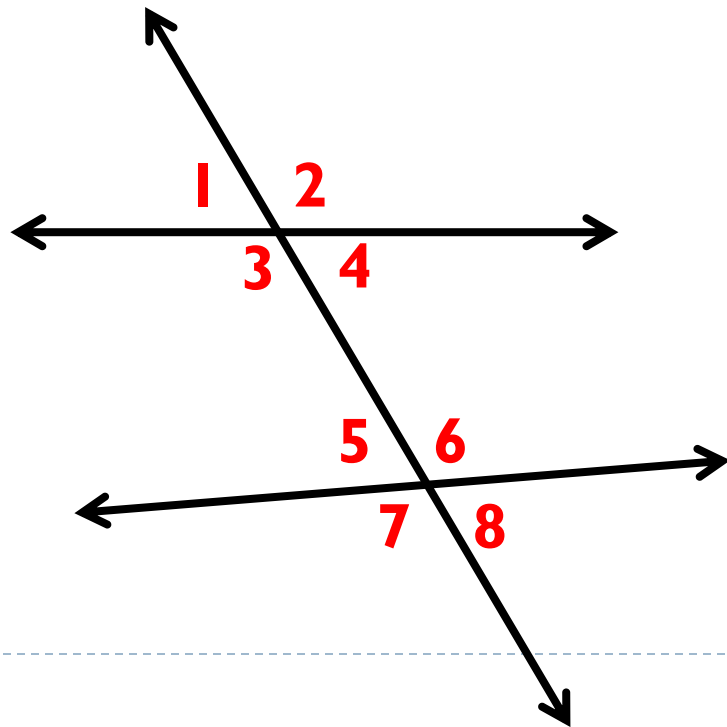
New terminology

- ▶ 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**

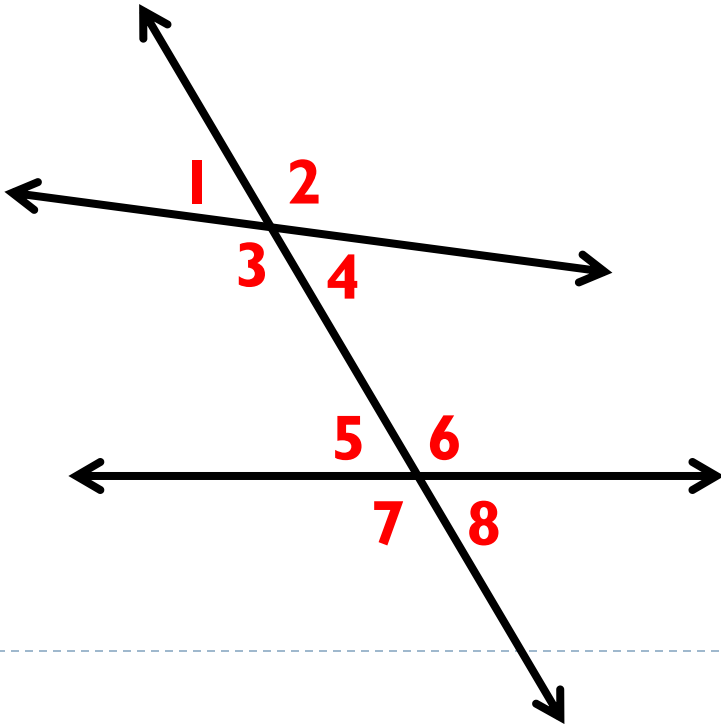


Give me an example of:

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

IN YOUR NOTES!

- ▶ **Alternate Interior:** $\angle 4$ and $\angle 5$, $\angle 3$ and $\angle 6$
- ▶ **Same-side Interior:** $\angle 3$ and $\angle 5$, $\angle 4$ and $\angle 6$
- ▶ **Alternate Exterior:** $\angle 1$ and $\angle 8$, $\angle 2$ and $\angle 7$
- ▶ **Corresponding:** $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 3$ and $\angle 7$, $\angle 4$ and $\angle 8$



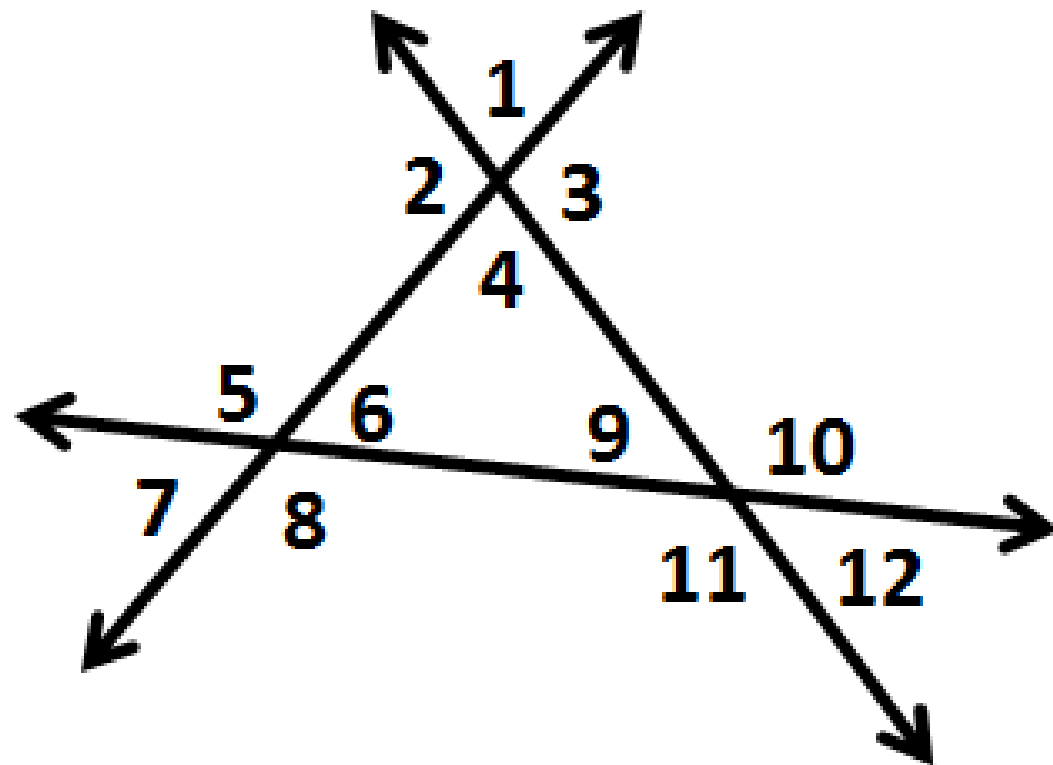
5) For each, identify the type of special angle pair.

a) $\angle 2$ and $\angle 6$

b) $\angle 7$ and $\angle 11$

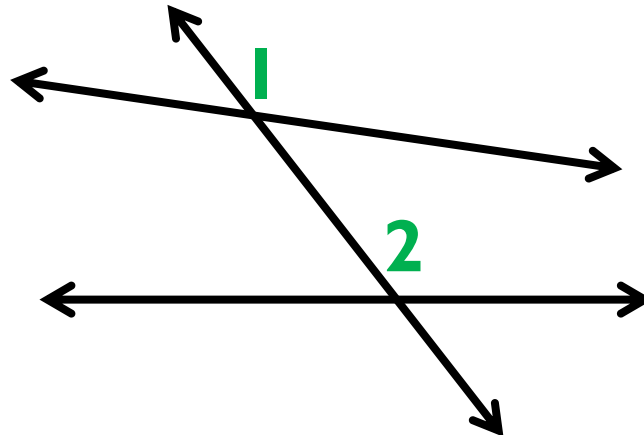
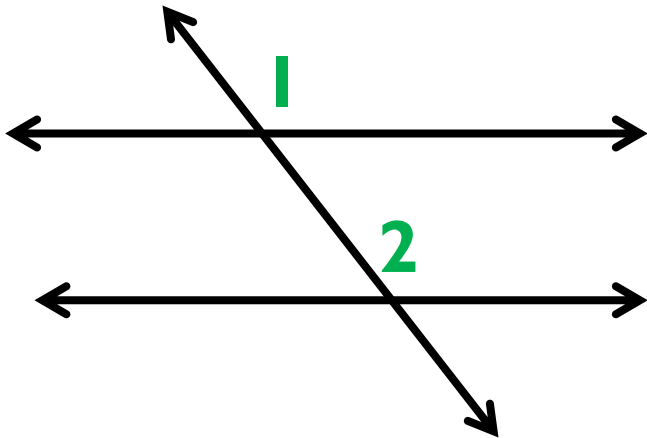
c) $\angle 4$ and $\angle 9$

d) $\angle 1$ and $\angle 11$



Corresponding Angles

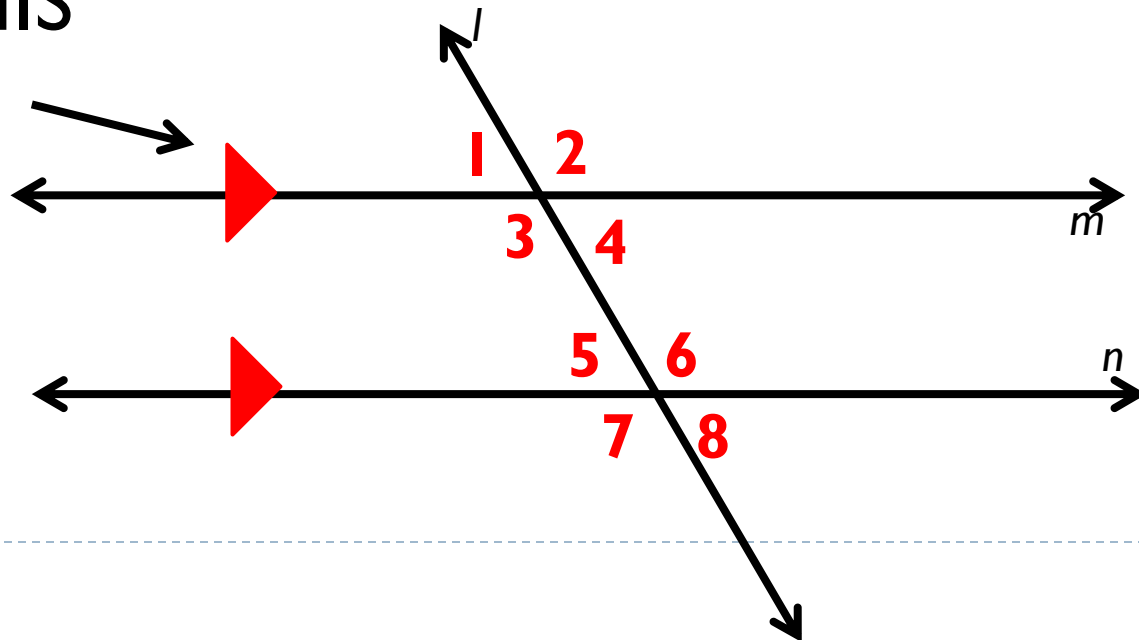
- ▶ If the lines are parallel, corresponding angles will be congruent!!!



DISCUSS WITH YOUR GROUP:

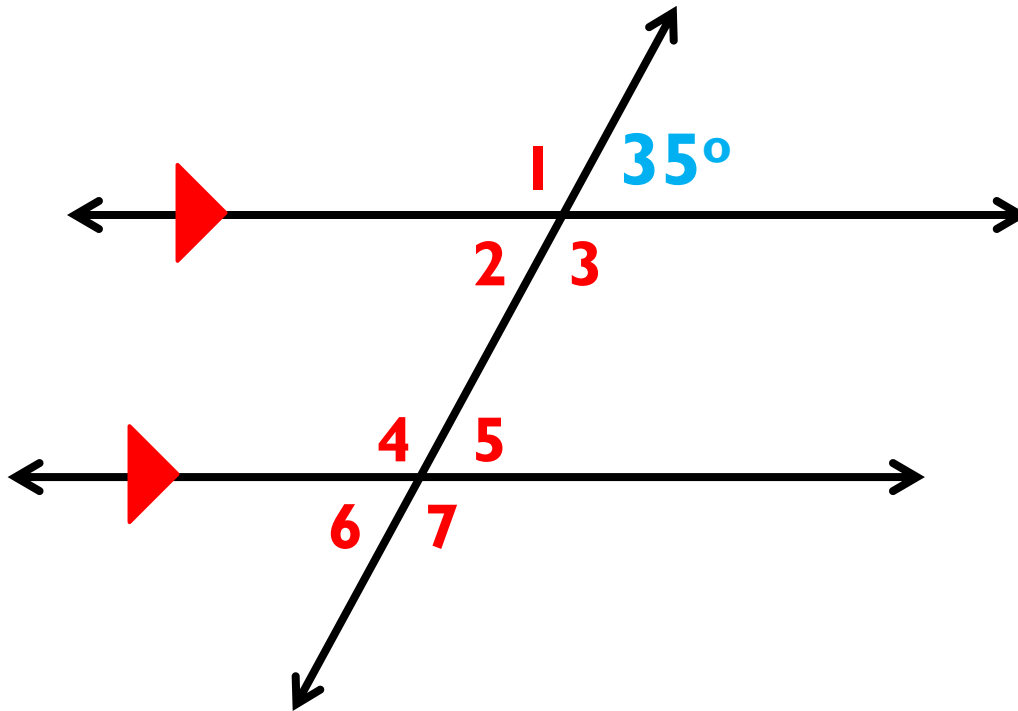
- ▶ **If lines m and n are parallel,** which angles are congruent to each other?
- ▶ Discuss in groups:
 - ▶ Which angles do you think are congruent?
 - ▶ Why do you think they are congruent?
 - ▶ Does your group all agree or not?

WHAT IS THIS
SYMBOL????



IN YOUR NOTES!

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



$$m\angle 1 = 145^\circ$$

$$m\angle 2 = 35^\circ$$

$$m\angle 3 = 145^\circ$$

$$m\angle 4 = 145^\circ$$

$$m\angle 5 = 35^\circ$$

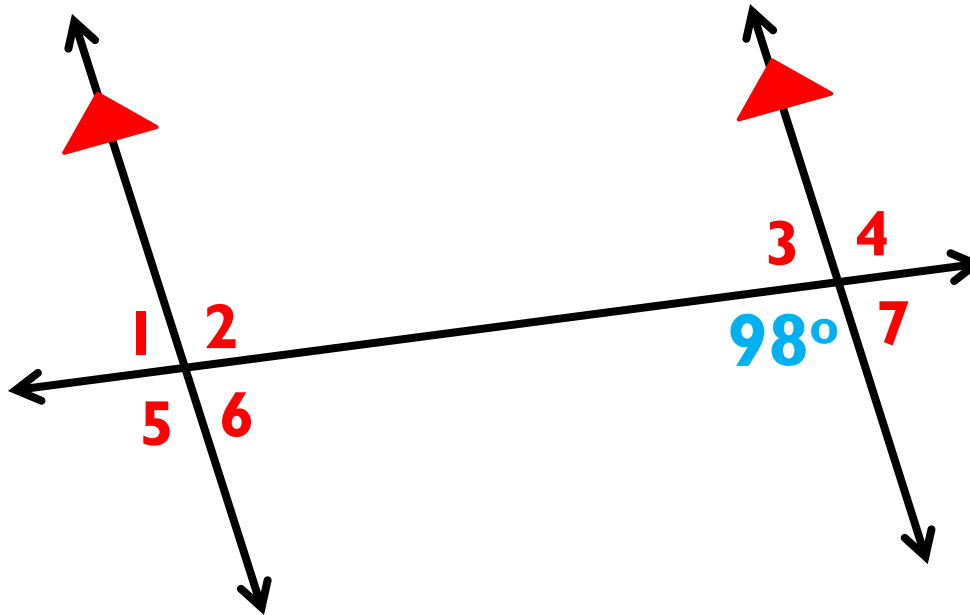
$$m\angle 6 = 35^\circ$$

$$m\angle 7 = 145^\circ$$



IN YOUR NOTES!

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



$$m\angle 1 = 82^\circ$$

$$m\angle 2 = 98^\circ$$

$$m\angle 3 = 82^\circ$$

$$m\angle 4 = 98^\circ$$

$$m\angle 5 = 98^\circ$$

$$m\angle 6 = 82^\circ$$

$$m\angle 7 = 82^\circ$$



IN YOUR NOTES

- ▶ 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



IN YOUR NOTES

▶ 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

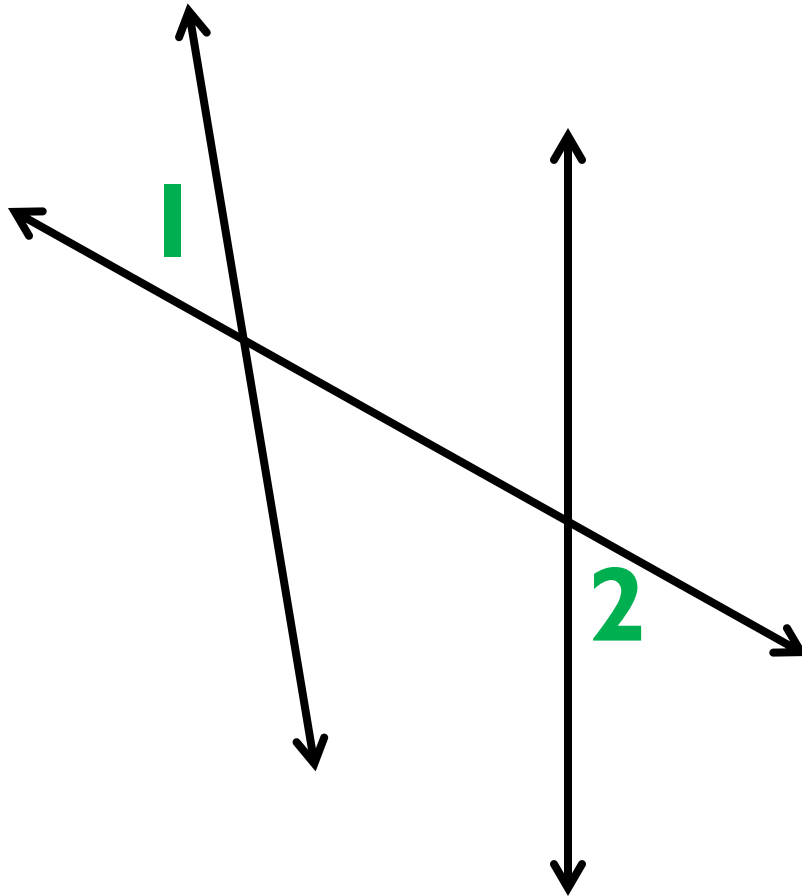
- ▶ **IF THE LINES ARE PARALLEL:**
 - ▶ Alternate Interior: congruent
 - ▶ Alternate Exterior: congruent
 - ▶ Same-side Interior: supplementary



Whiteboard Practice

You can always refer back to these slides on my website

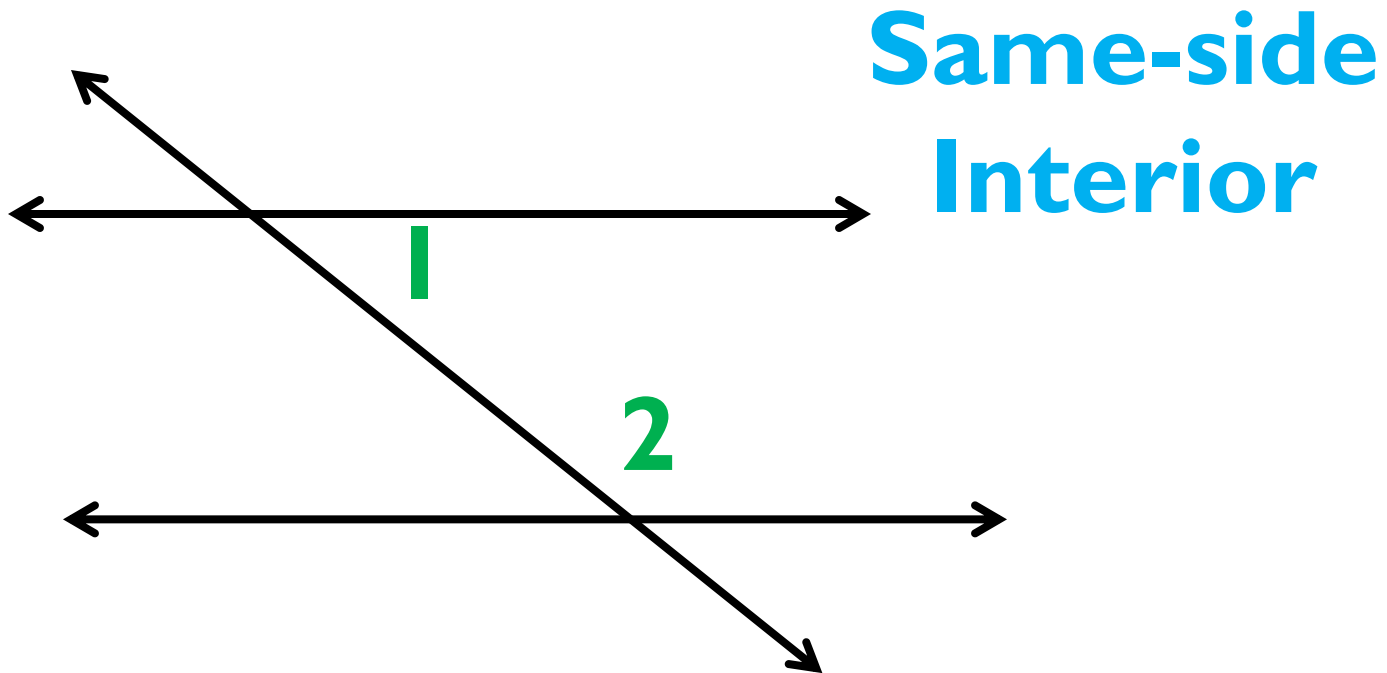
Which type of angle?



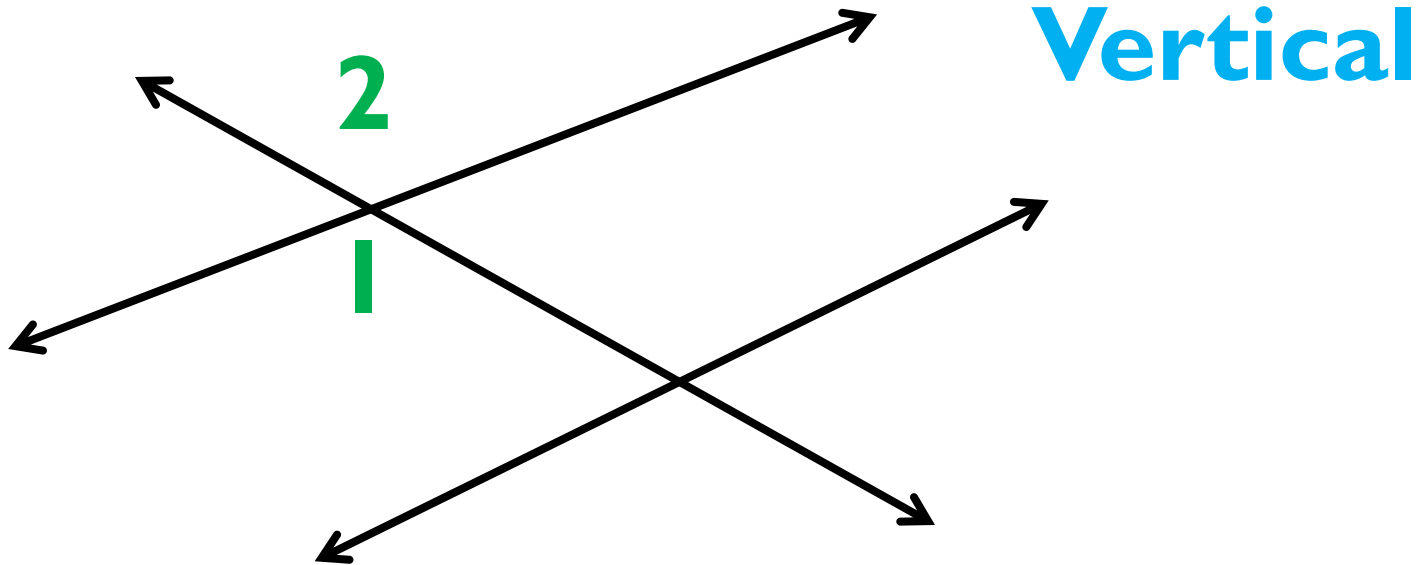
**Alternate
Exterior**



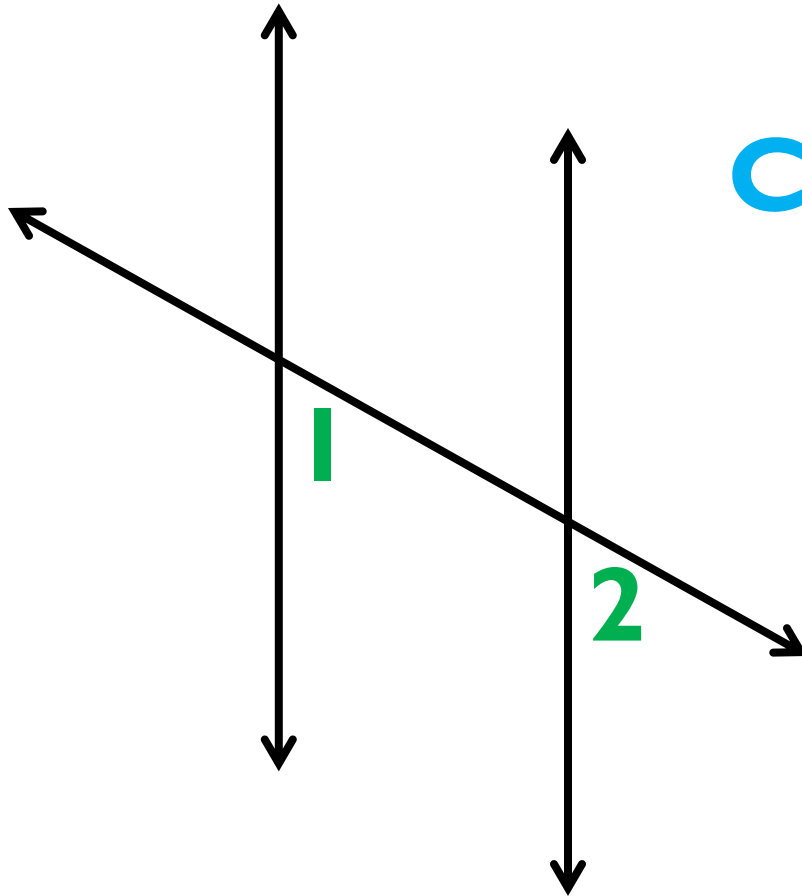
Which type of angle?



Which type of angle?



Which type of angle?

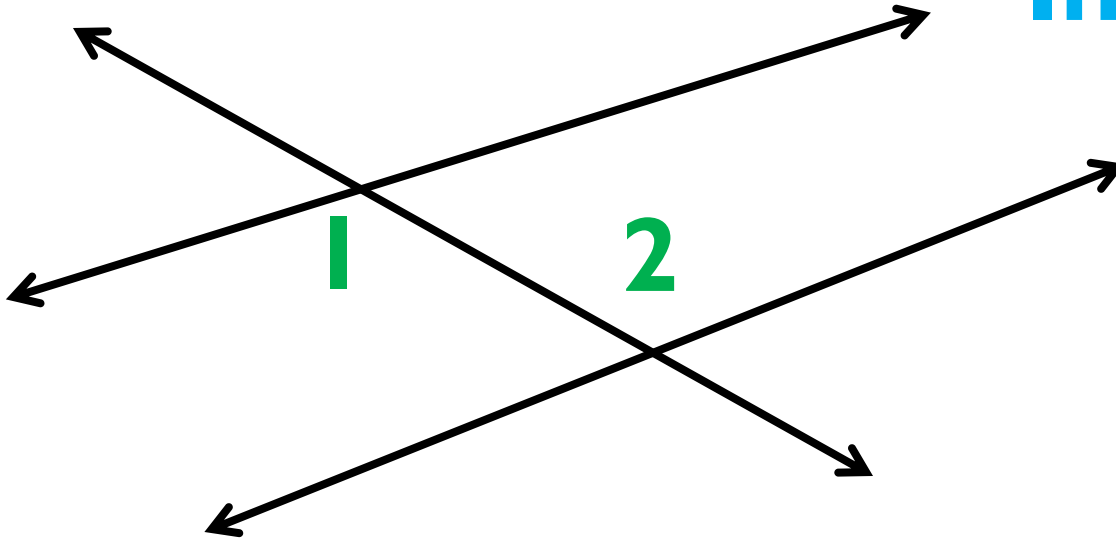


Corresponding

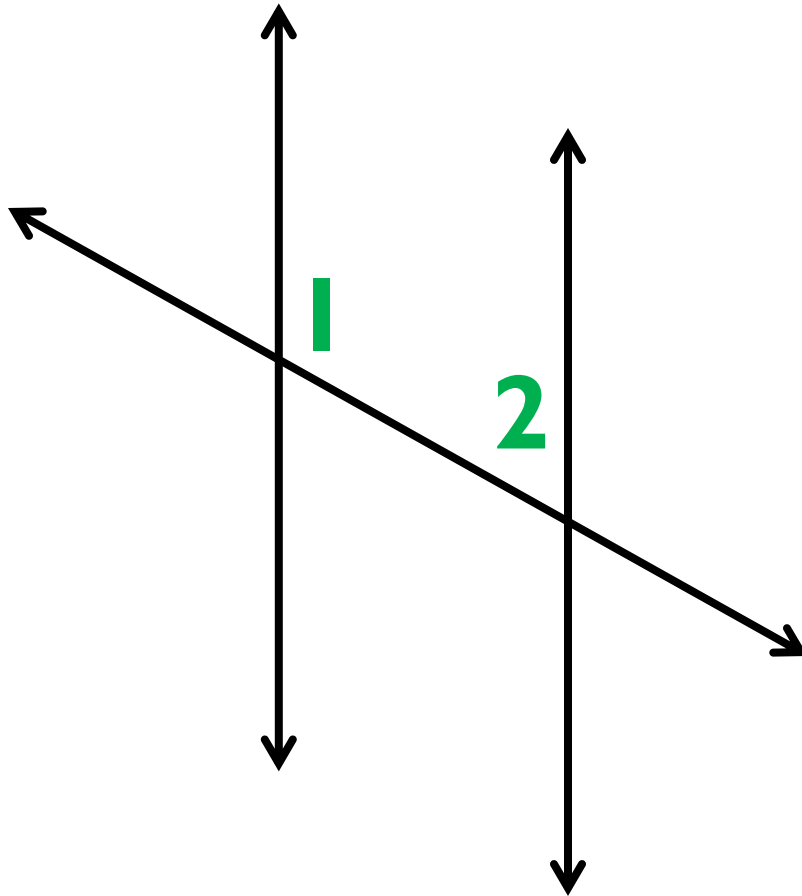


Which type of angle?

**Alternate
Interior**



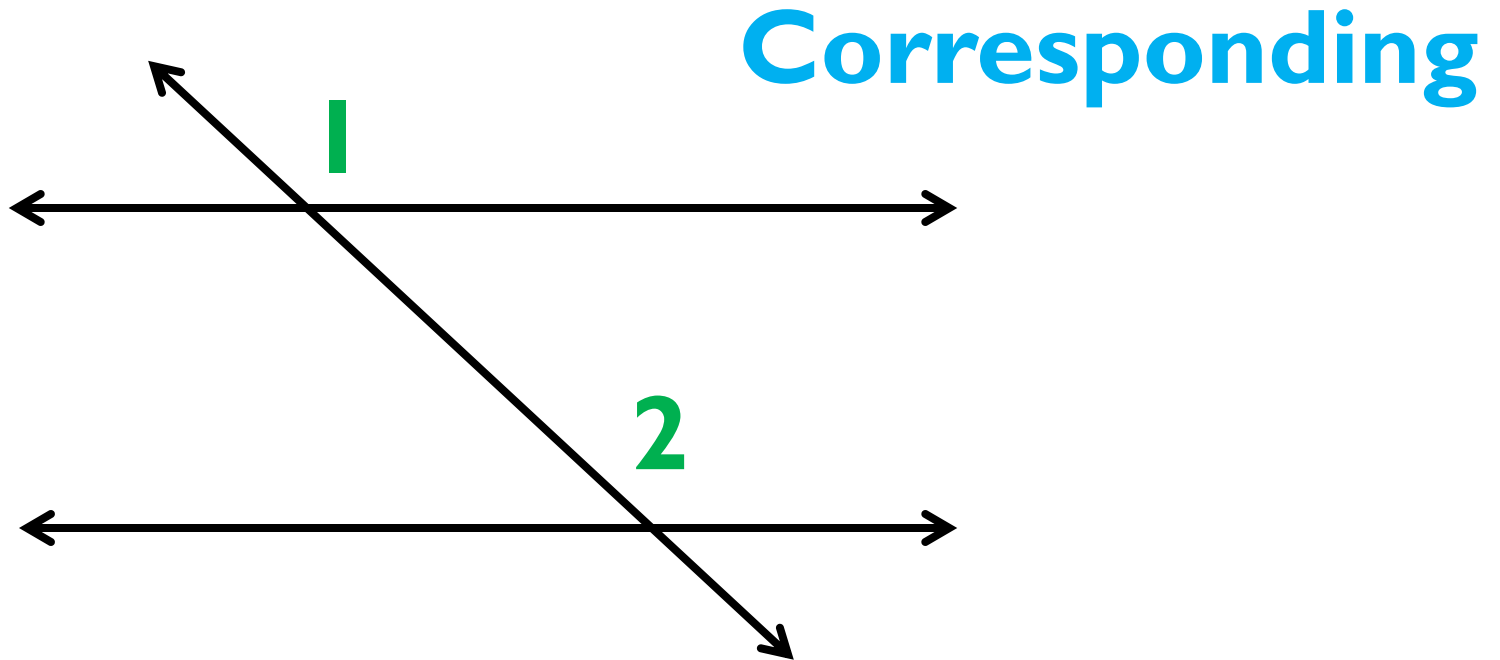
Which type of angle?



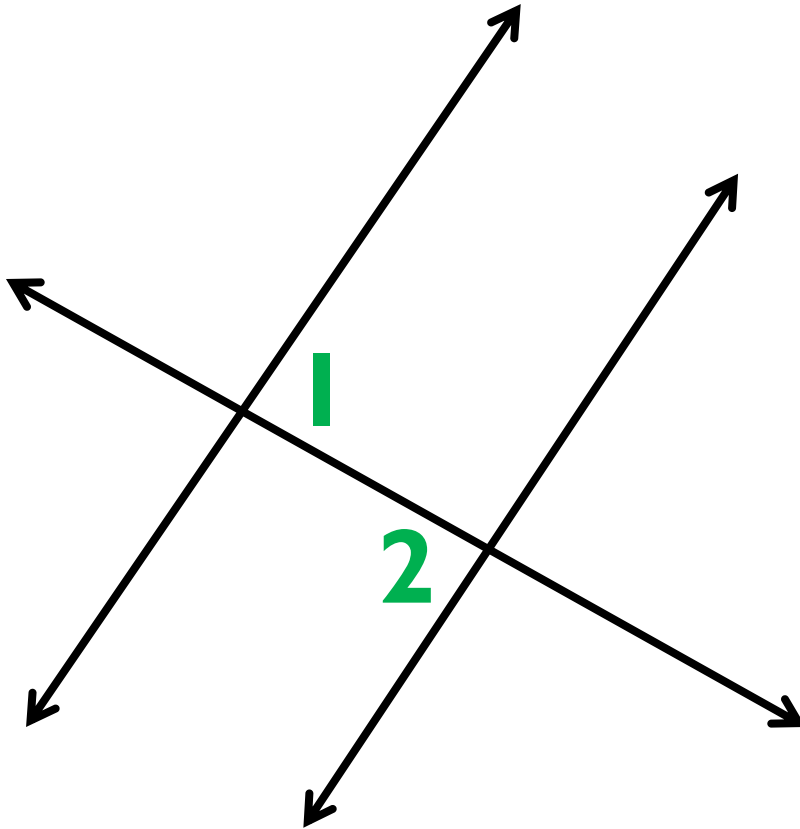
**Same-side
interior**



Which type of angle?



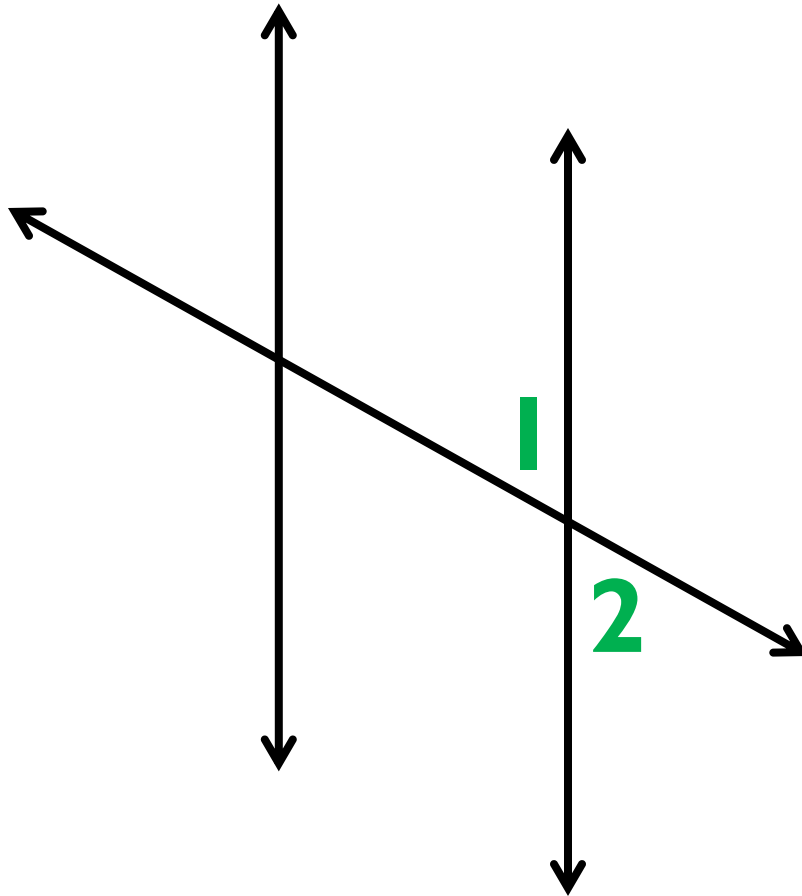
Which type of angle?



**Alternate
Interior**



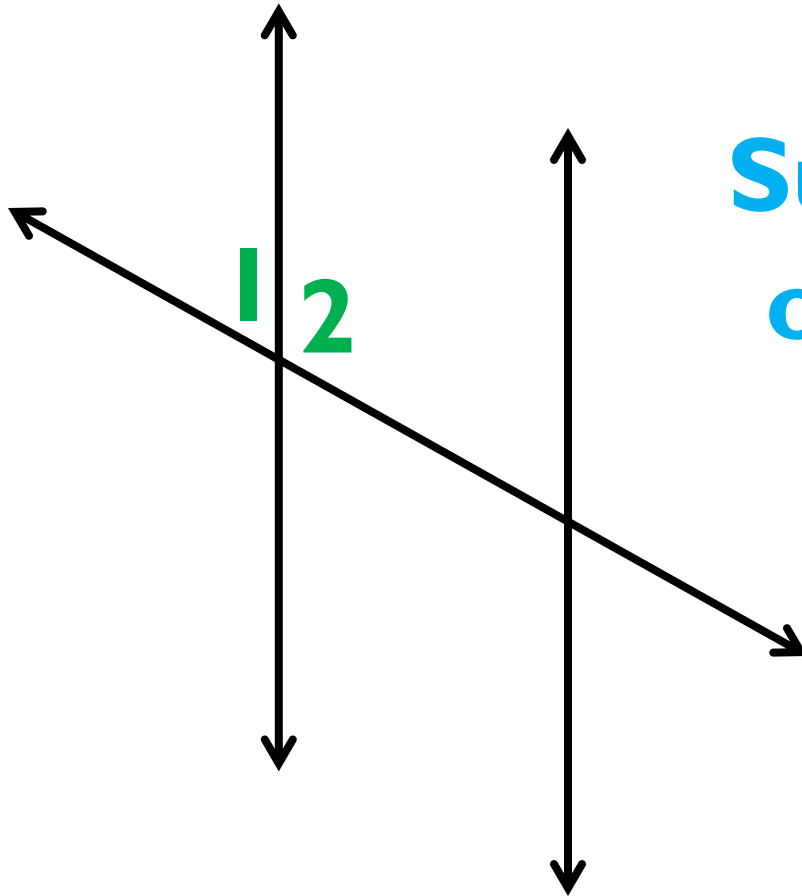
Which type of angle?



Vertical



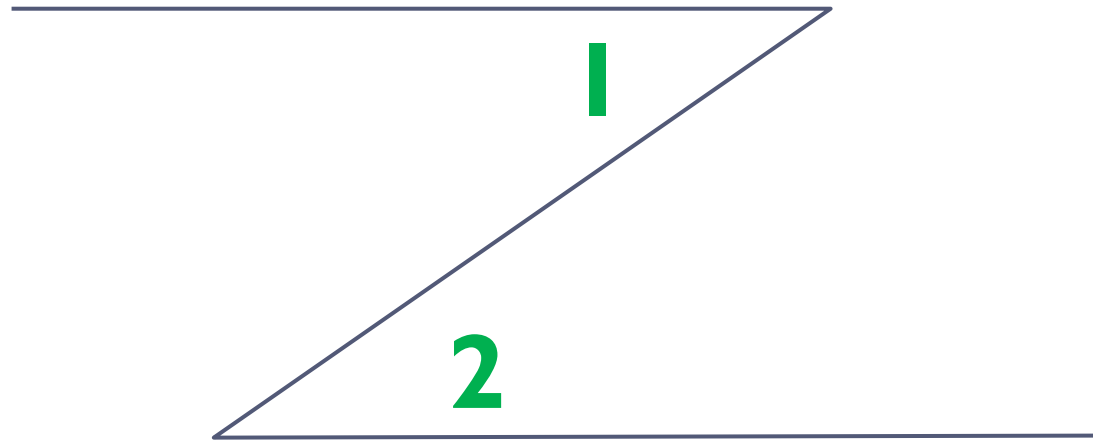
Which type of angle?



**Supplementary
or Linear Pair**



Which type of angle?

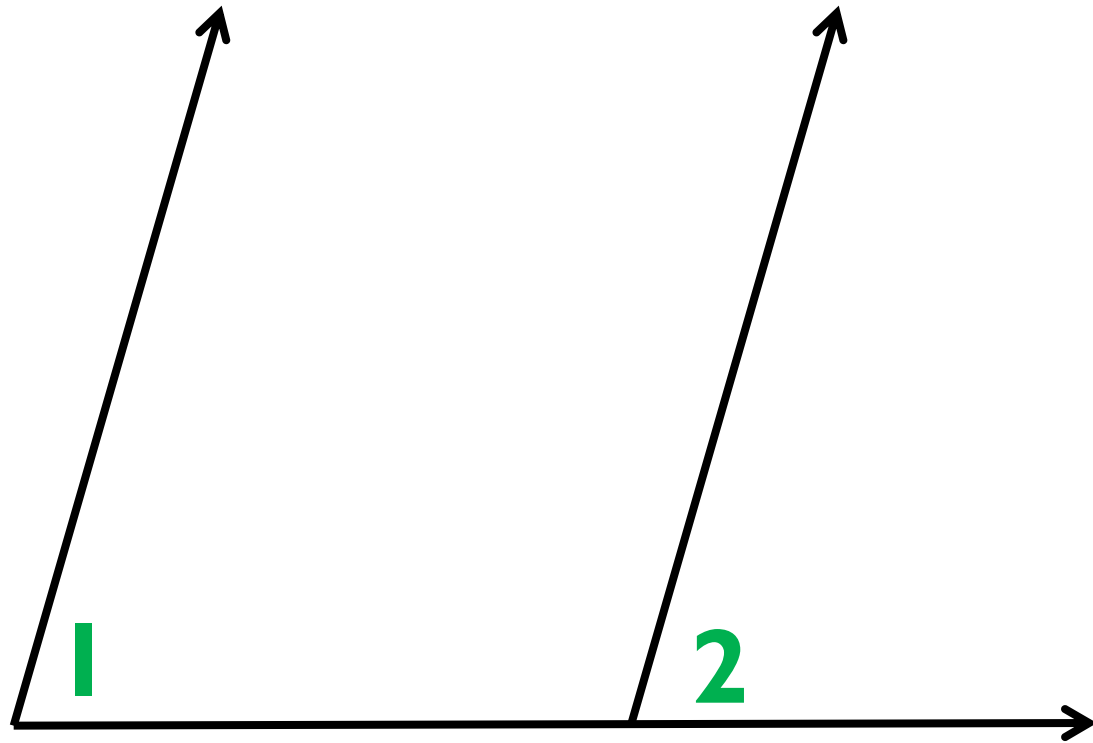


**Alternate
Interior**



Which type of angle?

Corresponding



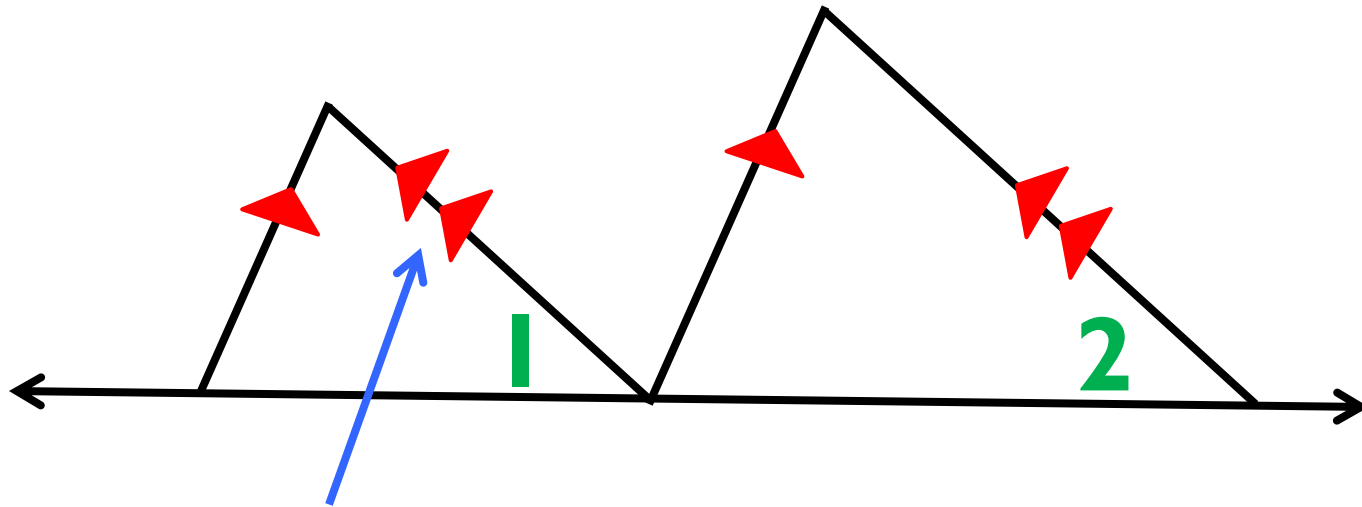
Which type of angle?

Same-side interior



Which type of angle?

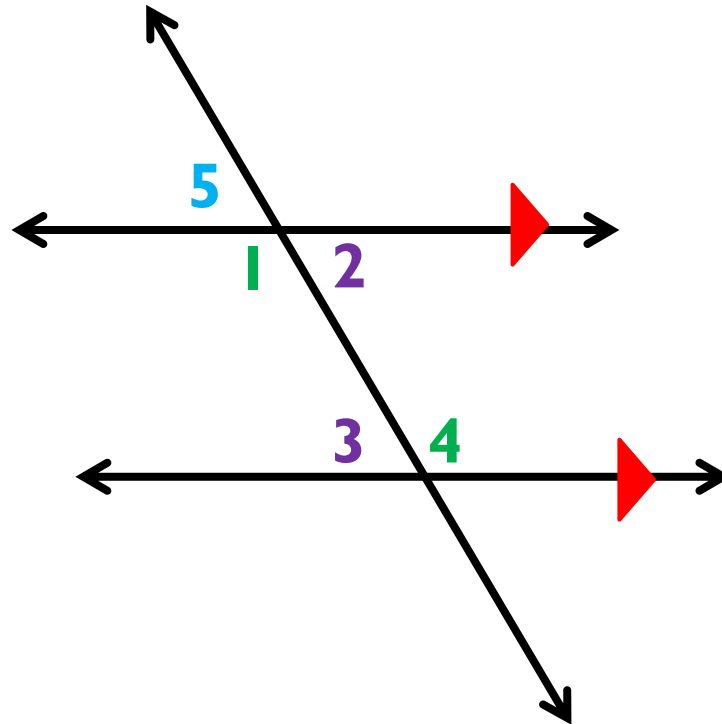
Corresponding



WHY ARE THERE TWO
ARROWS???

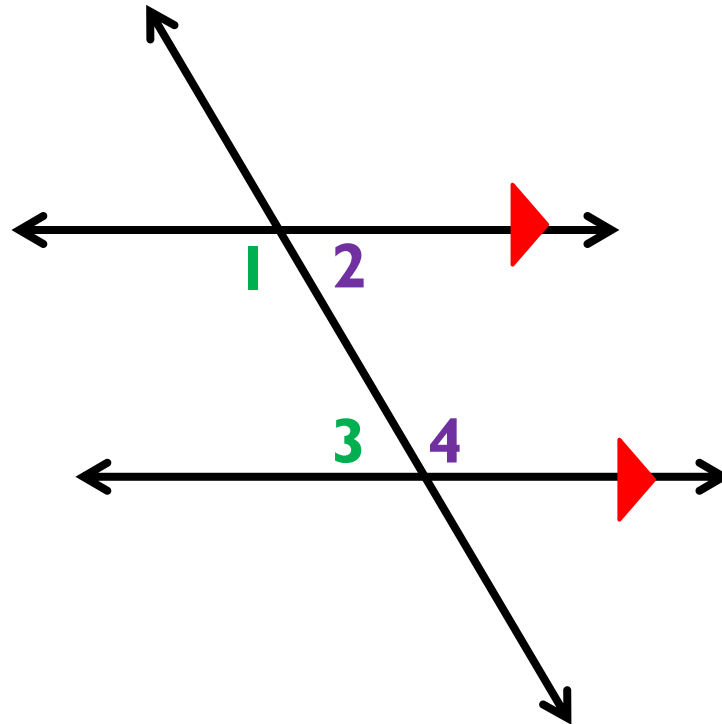


-
- ▶ What is **ALWAYS** true about alternate interior angles when two parallel lines are cut by a transversal?



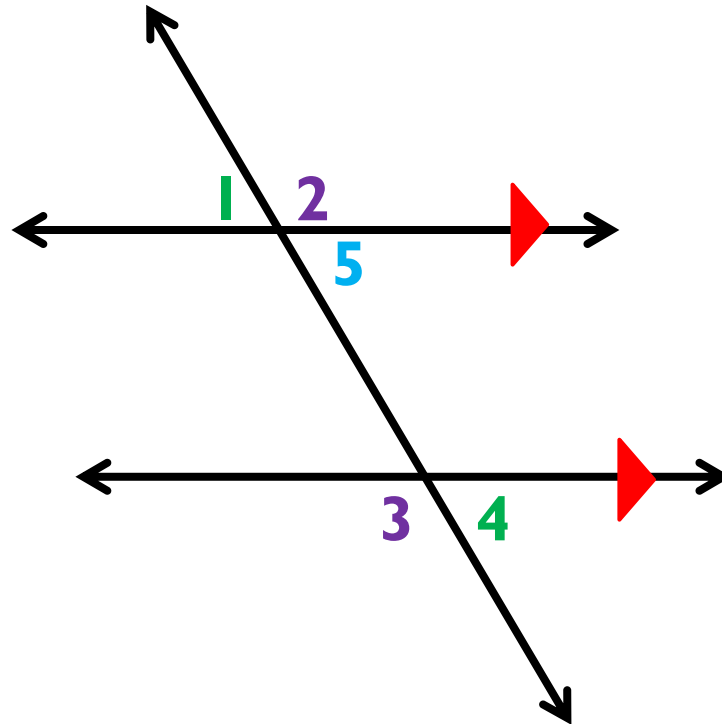
They are congruent

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



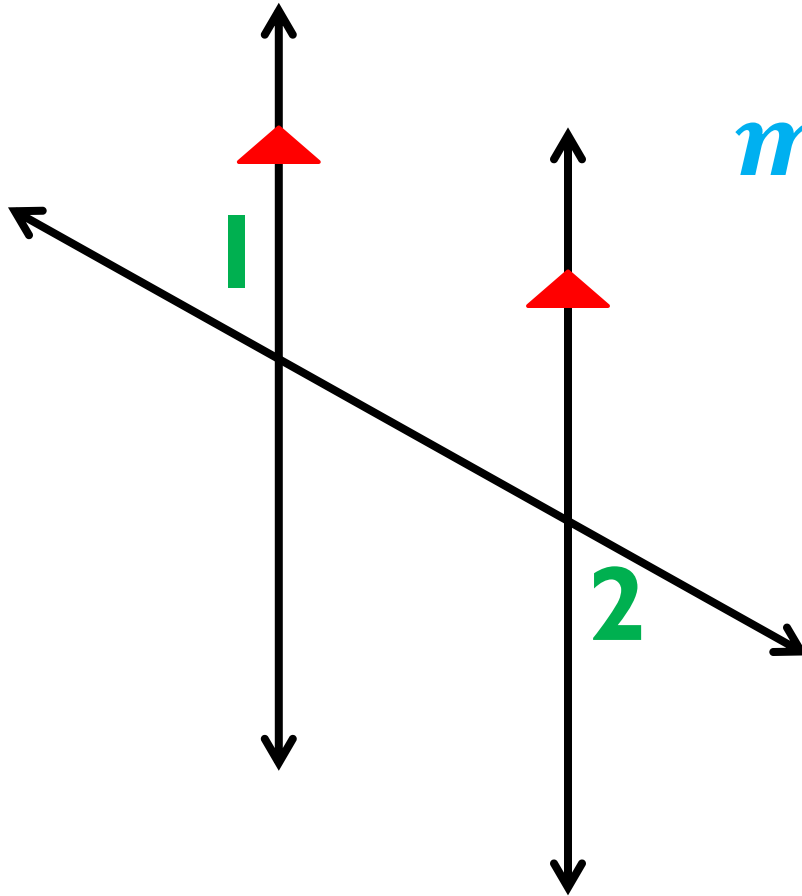
They are supplementary

-
- ▶ 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?**

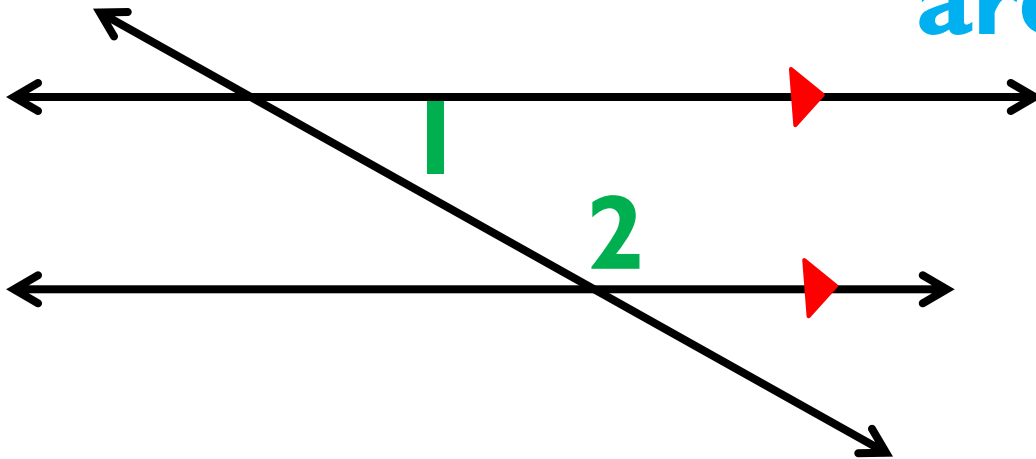


$m\angle 2 = 30^\circ$; they
are alternate
exterior



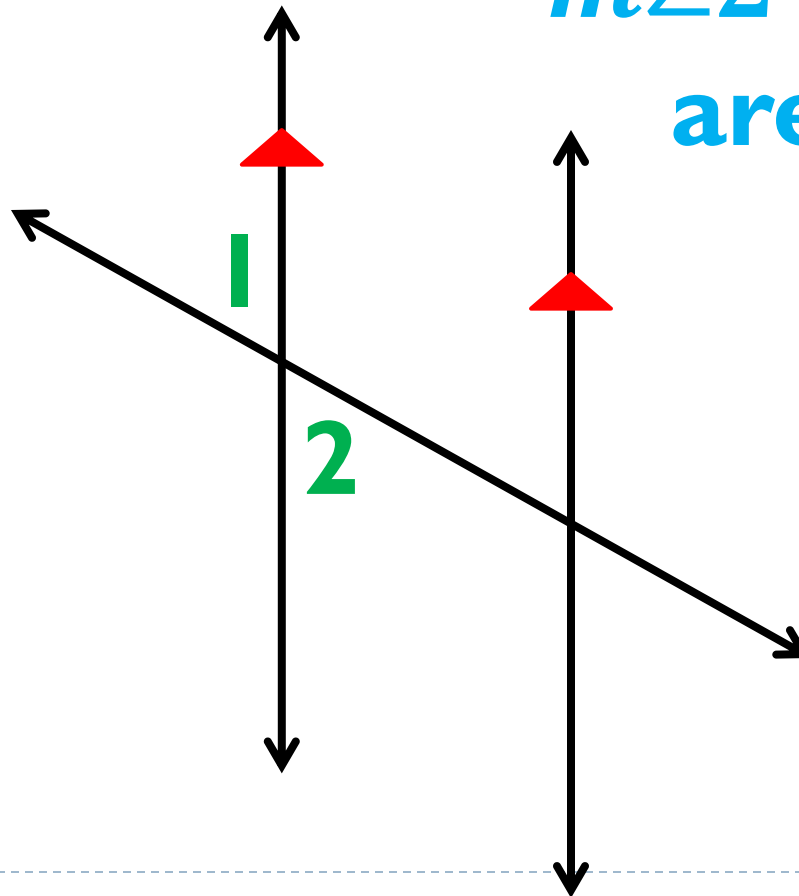
If the measure of angle 1 is 45 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

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



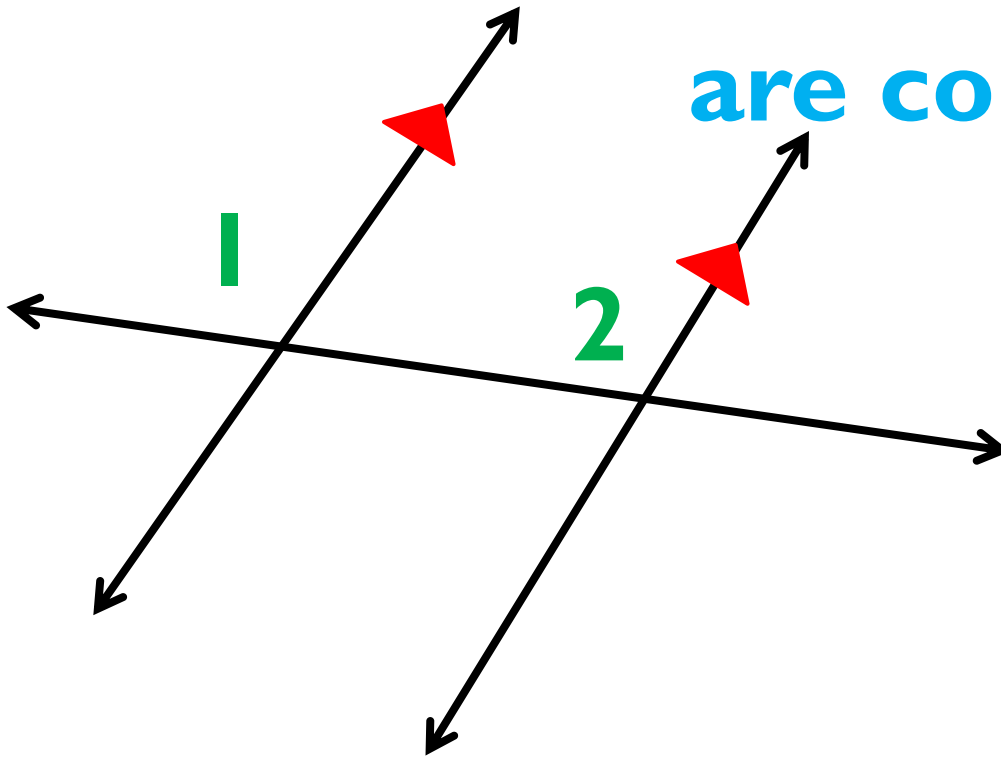
If the measure of angle 1 is 25 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

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



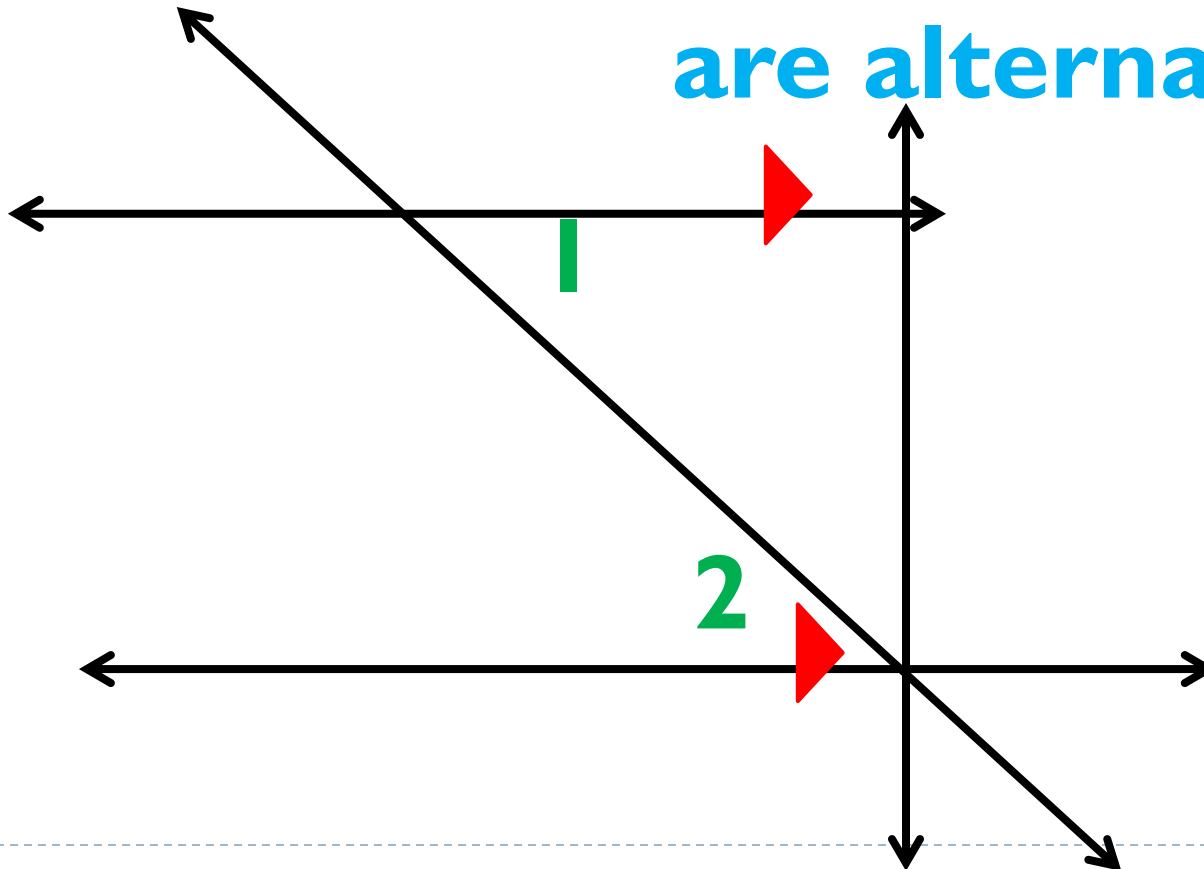
If the measure of angle 1 is 115 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

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



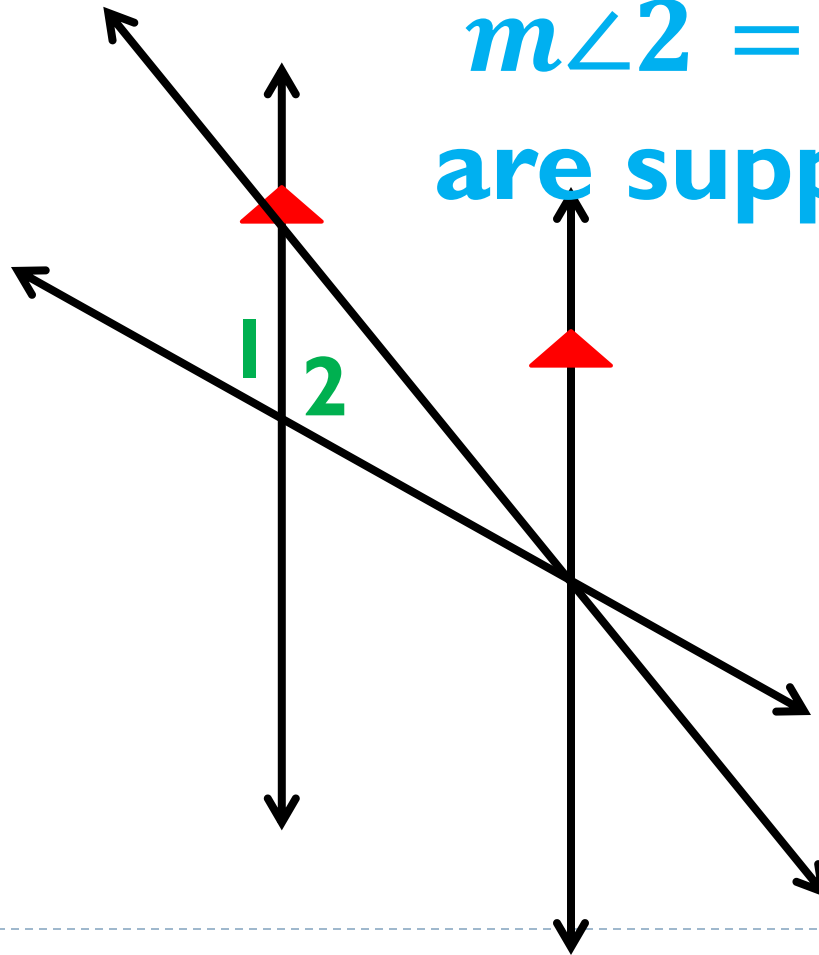
If the measure of angle 1 is 107 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

$m\angle 2 = 107^\circ$; they
are alternate interior

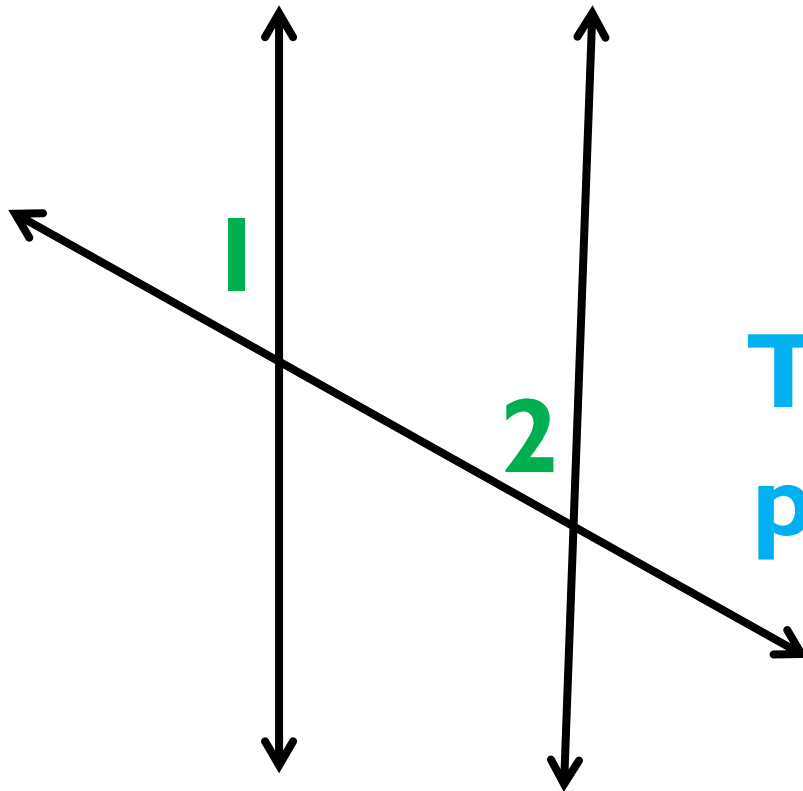


If the measure of angle 1 is 41 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**

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



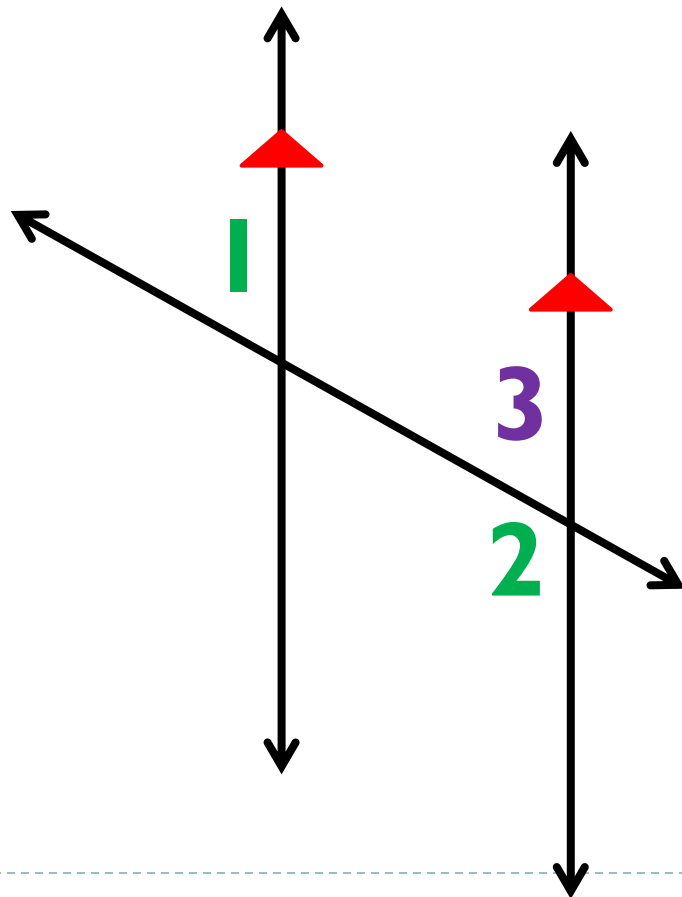
If the measure of angle 1 is 41 degrees, what is the
measure of angle 2? **HOW DO YOU KNOW?**



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



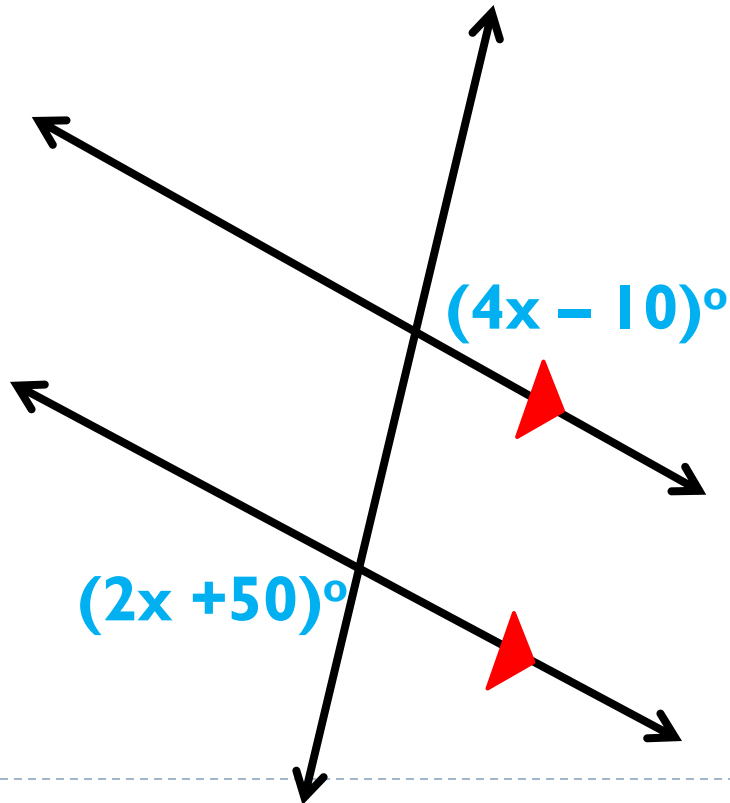
If the measure of angle 1 is 40 degrees, what is the measure of angle 2? **HOW DO YOU KNOW?**



$m\angle 2 = 140^\circ$;
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

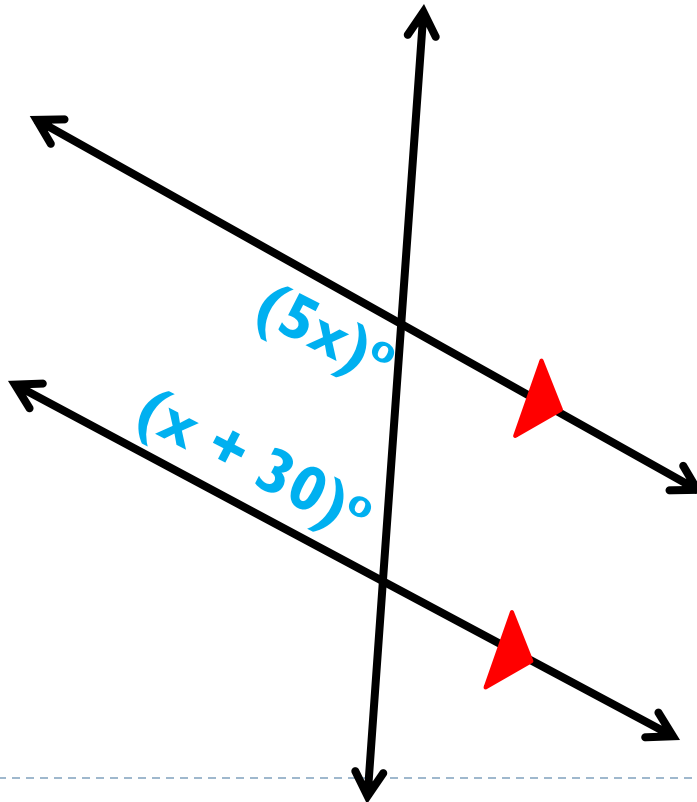
$$2x + 50 = 4x - 10$$

$$x = 30$$

With algebra...

- ▶ Find the measure of both angles.

**Same-side interior:
supplementary**



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

$$6x + 30 = 180$$

$$x = 25$$

Top angle:

$$5(25) = 125^\circ$$

Bottom angle:

$$25 + 30 = 55^\circ$$

Homework

▶ Parallel Lines Worksheet

