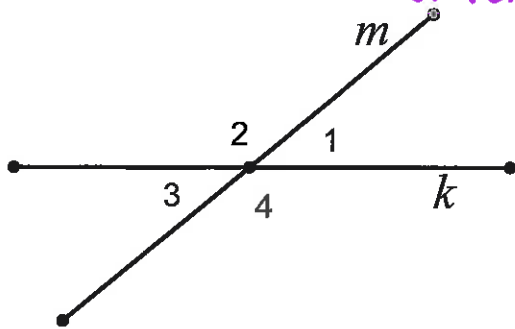


**Drawing Conclusions -  
Vertical, Supplementary, & Complementary Angles**

**Definitions:**

Adjacent Angles: 2 angles that share a side and vertex (next to each other)

Non-Adjacent Angles: 2 angles that do not share a side or do not share a vertex.



Lines m and k intersect:

Name 2 angles that are adjacent.

$\angle 1$  is adjacent to  $\angle 2$

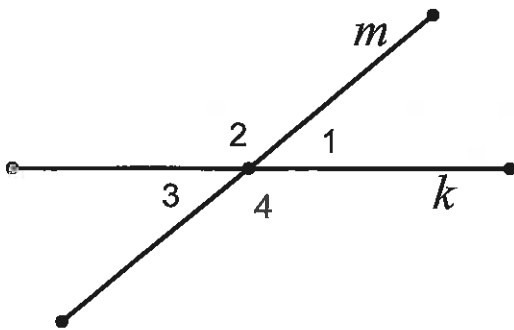
$\angle 3$  is adjacent to  $\angle 4$

Name 2 angles that are non-adjacent.

$\angle 1$  and  $\angle 3$  are not adjacent.

**Vertical Angles:** the non-adjacent  $\angle$ s formed by intersecting lines.

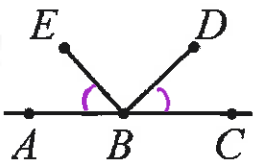
**Vertical Angles Theorem:** vertical angles are congruent.



Given: Lines m & k intersect.

Statements	Reasons
(Identify the Vert. $\angle$ 's) 1. <u><math>\angle 1</math> vertical <math>\angle 3</math></u>	1. Non-adj $\angle$ s formed by intersecting lines are vertical
(State they are $\cong$ ) 2. <u><math>\angle 1 \cong \angle 3</math></u>	2. vertical $\angle$ s $\cong$

Given:  $\overline{ABC}$ , are  $\angle ABE$  and  $\angle CBD$  vertical. Explain why or why not.

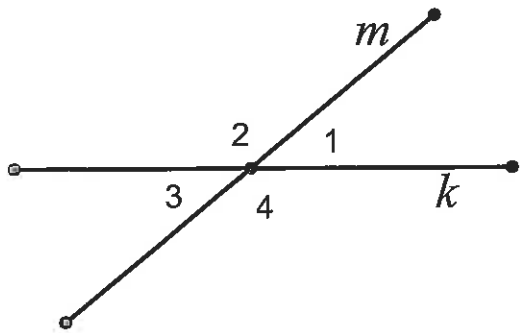


No they are not vertical. The angles are not formed by 2 intersecting lines

Supplementary Angles: 2 angles that add to 180°

Supplementary Angles Theorem: the adjacent angles formed by intersecting lines are supplementary.

Given: Lines  $m$  &  $k$  intersect.

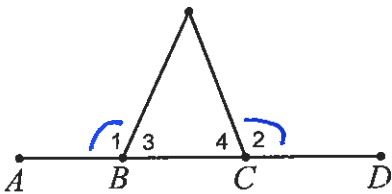


Option #1: Definition of Supp.

Statements	Reasons
(Identify the Supp. $\angle$ 's) 1. <u><math>\angle 1</math> supp <math>\angle 4</math></u>	1. adj $\angle$ s formed by intersecting lines are supp
(Use the Supp. $\angle$ 's) 2. <u><math>m\angle 1 + m\angle 2 = 180</math></u>	2. supp $\angle$ s add to 180

Option #2:

Supp. Theorem 1:  $\cong \angle$ 's have  $\cong$  supplements.



Given:  $\overline{ABCD}$

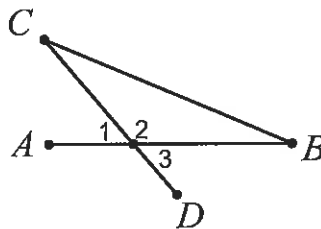
$\angle 1 \cong \angle 2$

diff  $\angle$ s

Statements	Reasons
(Identify the Supp. $\angle$ 's) 1. <u><math>\angle 1</math> supp <math>\angle 3</math></u> <u><math>\angle 2</math> supp <math>\angle 4</math></u>	1. adj $\angle$ s formed by int. lines are supp
(Use the Supp. $\angle$ 's) 2. <u><math>\angle 3 \cong \angle 4</math></u>	2. $\cong \angle$ s have $\cong$ supps.

Options #3:

Supp. Theorem 2: 2  $\angle$ 's supp. to the same  $\angle$  are  $\cong$ .



Given:  $\overline{AB}$  and  $\overline{CD}$  intersect

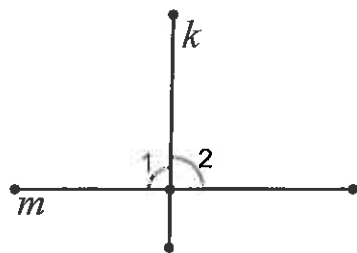
Statements	Reasons
(Identify the Supp. $\angle$ 's) 1. <u><math>\angle 1</math> supp <math>\angle 2</math></u> <u><math>\angle 2</math> supp <math>\angle 3</math></u>	1. adj $\angle$ s formed by intersecting lines are supp
(Use the Supp. $\angle$ 's) 2. <u><math>\angle 1 \cong \angle 3</math></u>	2. $\angle$ s supp to the same $\angle$ are $\cong$ .

Option #4:

Supp. Theorem 3:  $\angle$ 's that are both  $\cong$  and supp. are each  $90^\circ$ . (right  $\angle$ s)

Given: Line  $m$  &  $k$  intersect.

$$\angle 1 \cong \angle 2$$

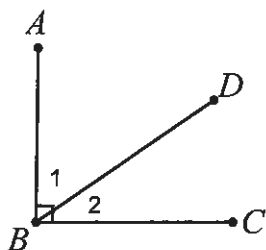


Statements	Reasons
(Identify the Supp. $\angle$ 's) 1. $\angle 1$ supp $\angle 2$	1. adj $\angle$ s formed by intersecting lines are Supp
(Use the Supp. $\angle$ 's) 2. $\angle 1$ & $\angle 2$ are rt $\angle$ s.	2. $\angle$ s that are both $\cong$ and supp are rt $\angle$ s.

\*\*Complementary Angles work exactly the same as Supplementary Angles!

Complementary Angles: 2 angles that add to  $90^\circ$

Complimentary Angles Theorem: adjacent  $\angle$ s that form a right  $\angle$  are complementary



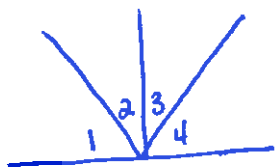
Given:  $\angle ABC$  is a right Angle

Conclusion:  $\angle 1$  and  $\angle 2$  are complementary

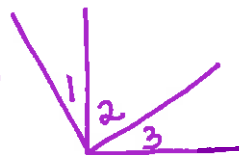
Complimentary Theorem 1:  $\cong \angle$ 's have  $\cong$  complements.

Complimentary Theorem 2: 2  $\angle$ 's complementary to the same  $\angle$  are  $\cong$ .

Given:  $\angle 1$  comp  $\angle 2$   
 $\angle 3$  comp  $\angle 4$   
 $\angle 1 \cong \angle 4$



Given:  $\angle 1$  &  $\angle 2$  comp  
 $\angle 2$  &  $\angle 3$  comp



Concl:  $\angle 1 \cong \angle 3$   $\angle$ s comp to the same  $\angle$  are  $\cong$ .

Concl:  $\angle 2 \cong \angle 3$   $\cong \angle$ s have  $\cong$  comps.

