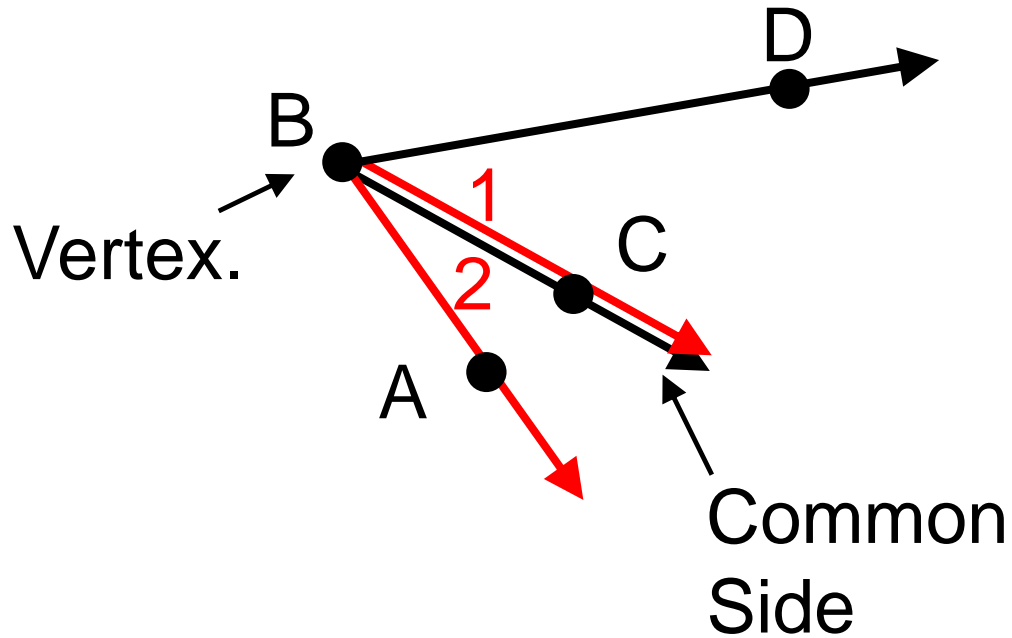# Math-2A

Lesson 8-4
Special Angle Pairs

Adjacent Angles have a common side and share a common vertex

$\angle ABC$

is adjacent to __

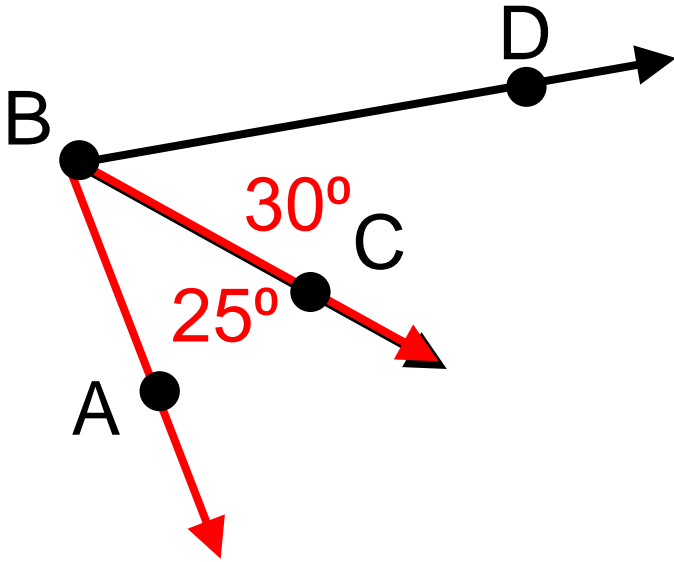$\angle CBD$

$\angle 2$

is adjacent to ____

$\angle 1$

Angle Addition Postulate
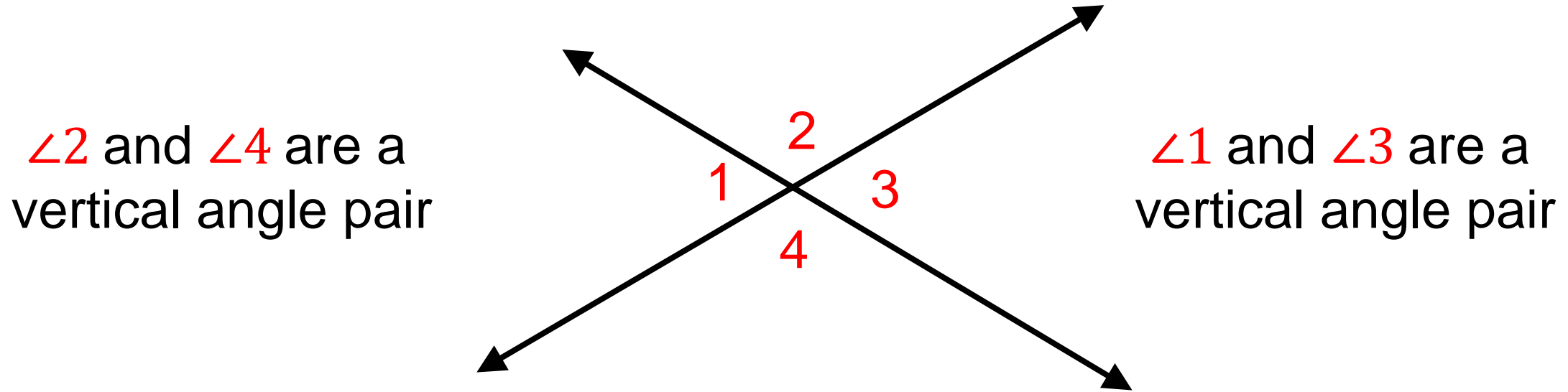If $\angle ABC$ is adjacent to $\angle CBD$ then m$\angle ABC$ + m$\angle CBD$ = m$\angle ABD$

Angle Addition Postulate

If $\angle ABC$ is adjacent to $\angle CBD$ then $m\angle ABC + m\angle CBD = m\angle ABD$

D

B

30^0 C

25^0

A

$25^0 + 30^0 = 55^0 = m\angle ABD$

Vertical Angle Pair: angles formed by two crossing lines and have no common sides.

∠2 and ∠4 are a vertical angle pair
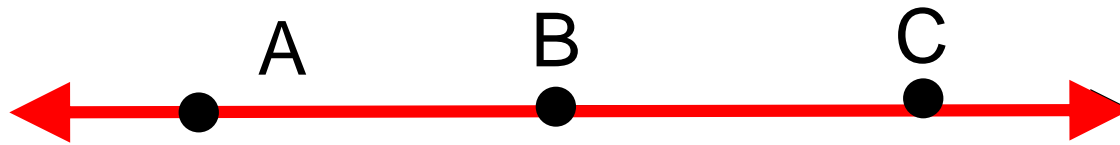
2

1   3

4

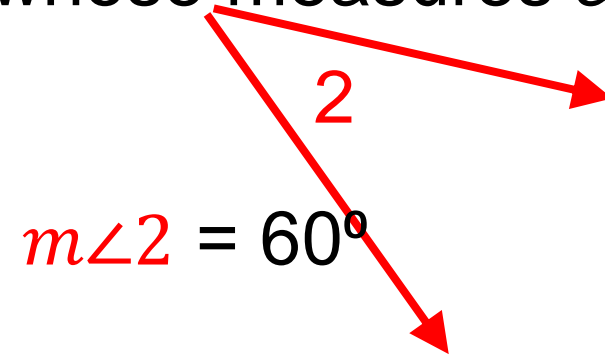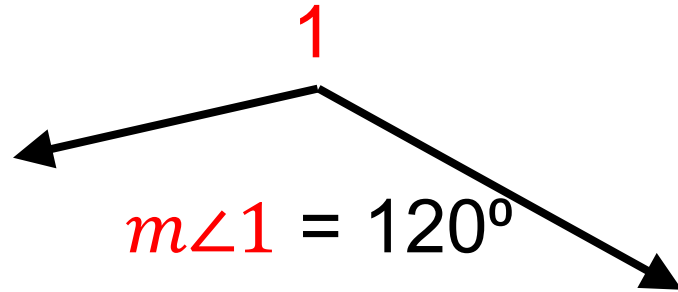∠1 and ∠3 are a vertical angle pair

Are there any other vertical angle pairs?

Vertical Angle Pair Theorem: If two angles are form a vertical angle pair then the two angles are congruent.
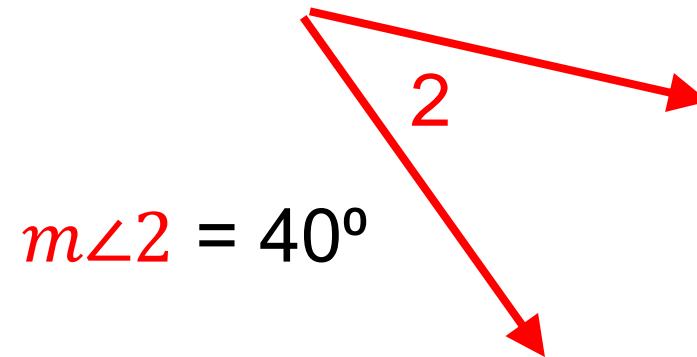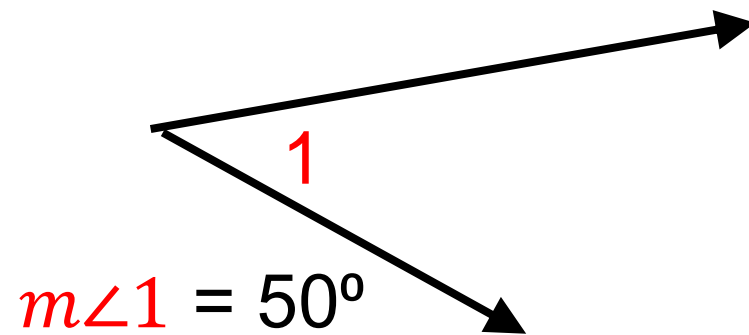
Straight Angle is formed by two "opposite rays" (that are collinear) and whose measure is 180° .
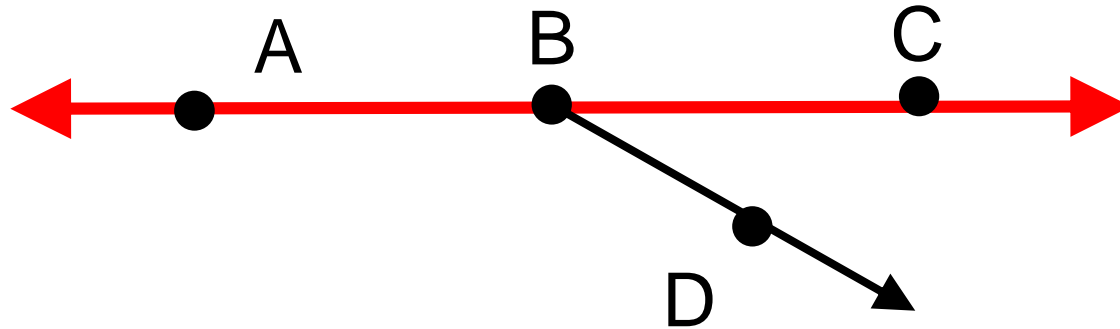
A   B   C

Supplementary Angles are any two angles whose measures add up to 180.

1

$m\angle 1 = 120^0$

2

$m\angle 2 = 60^0$

Complementary Angles are any two angles whose measures add up to 90.

1

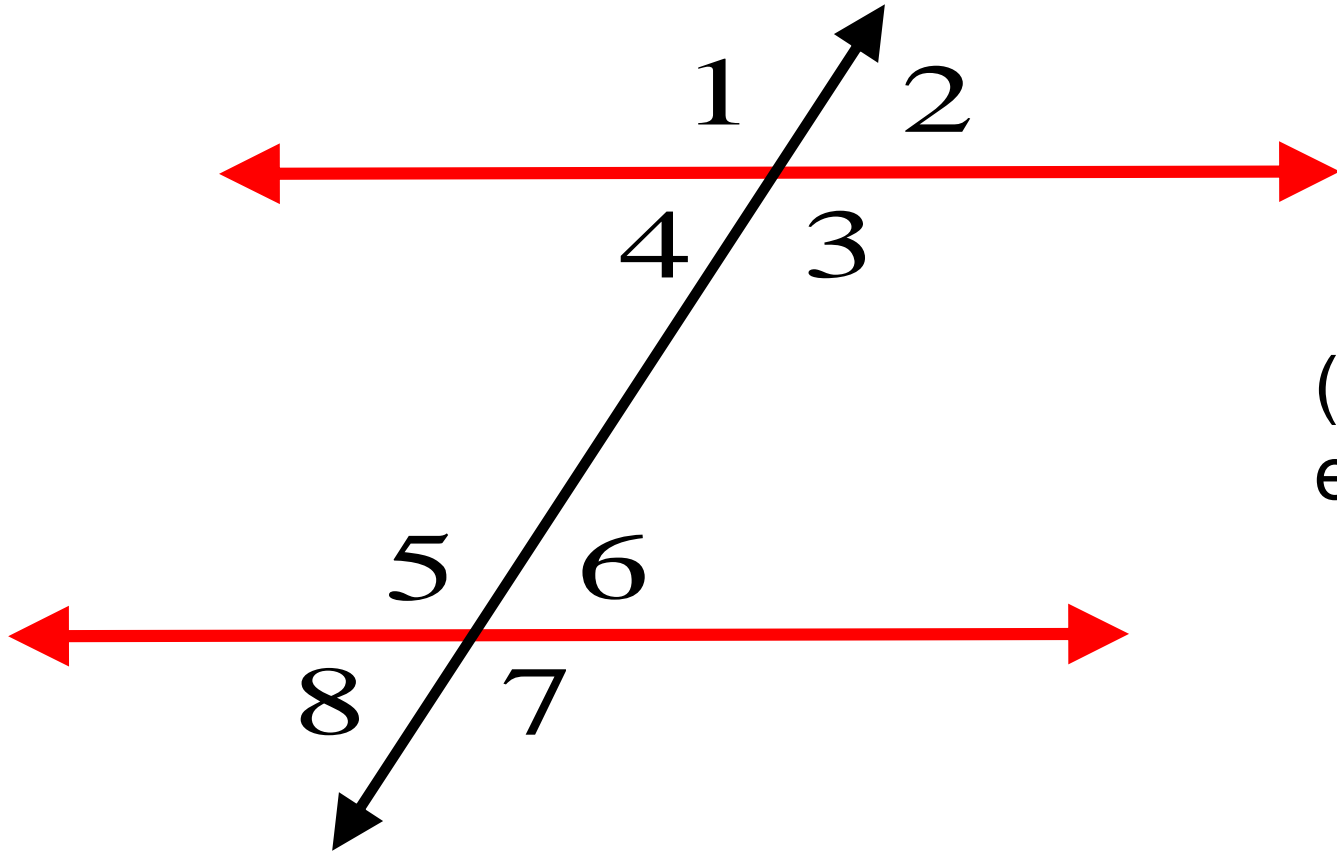$m\angle 1 = 50^0$

2

$m\angle 2 = 40^0$

Linear Pair of Angles are adjacent angles with two sides that form a straight angle.
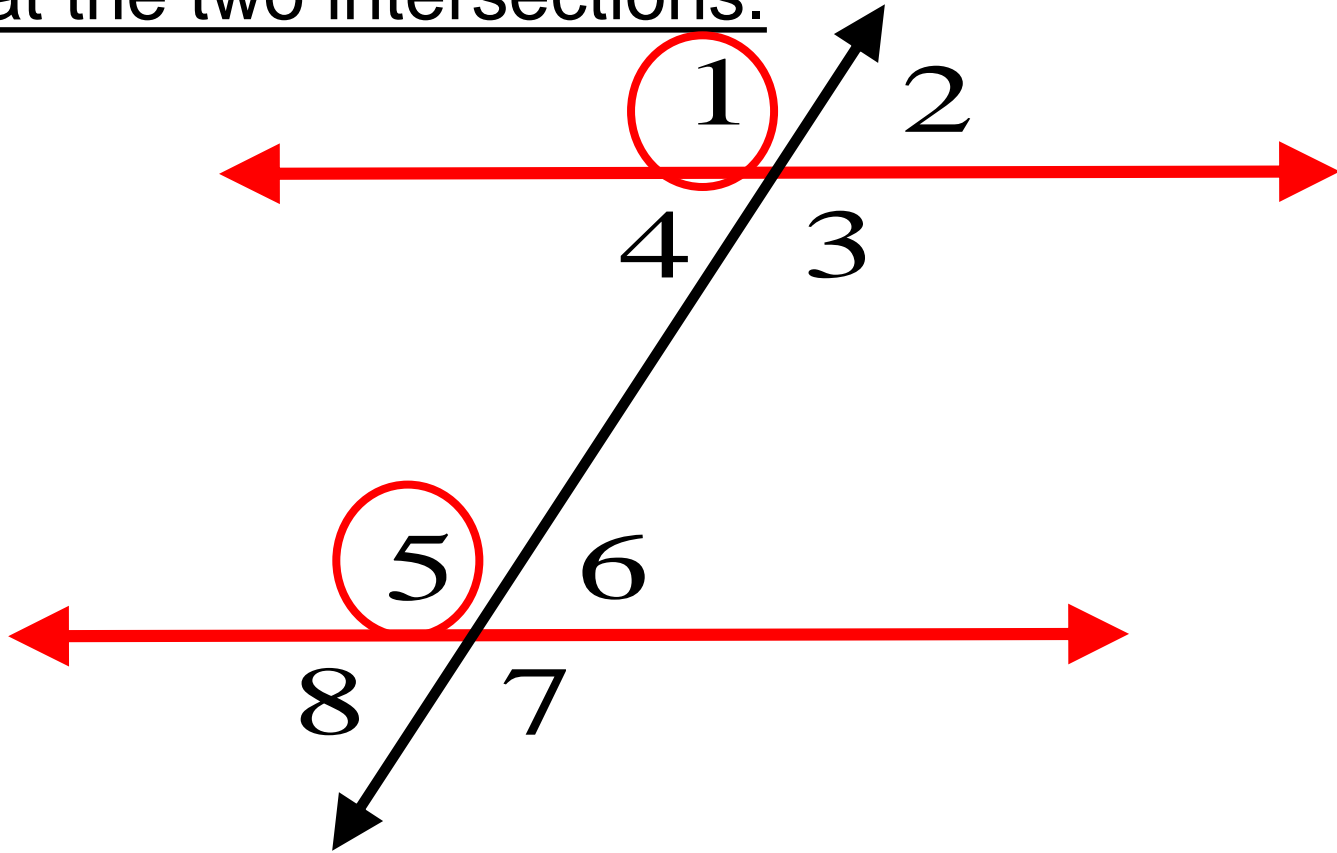

Linear Pair Theorem: If two angles are adjacent angles that form a straight angle then their measures add up to 180.

Transversal line: A line that intersects two other lines (usually parallel lines).

1 2

4 3

(not counting straight angles),
eight angles are formed.

5 6

8 7

Corresponding Angles: pairs of angles that are in the same relative position at the two intersections.
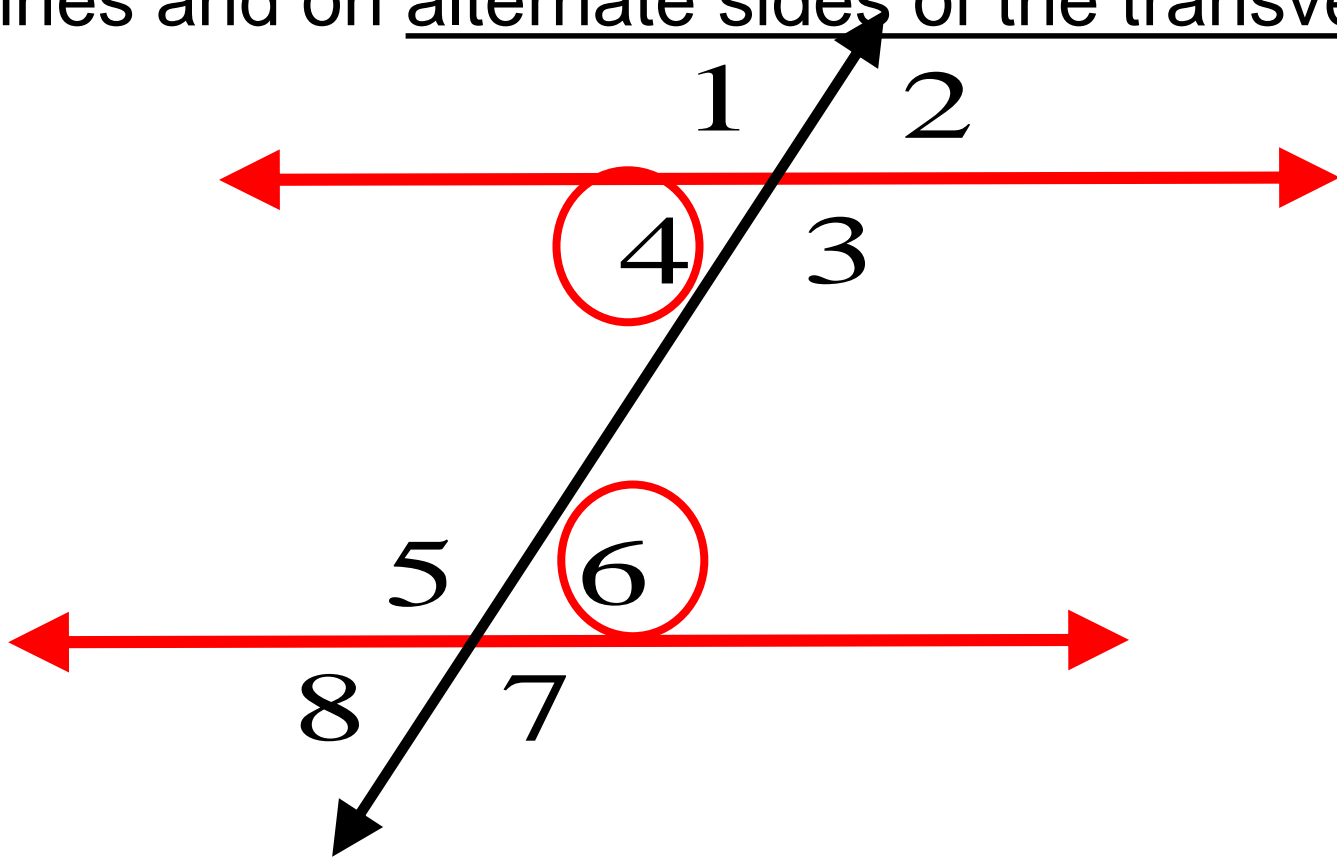

$\angle 1, \angle 5$

Name the three other corresponding angle pairs.

$\angle 2, \angle 6$

$\angle 3, \angle 7$

$\angle 4, \angle 8$

Alternate Interior Angles: pairs of angles that are in between the parallel lines and on alternate sides of the transversal.
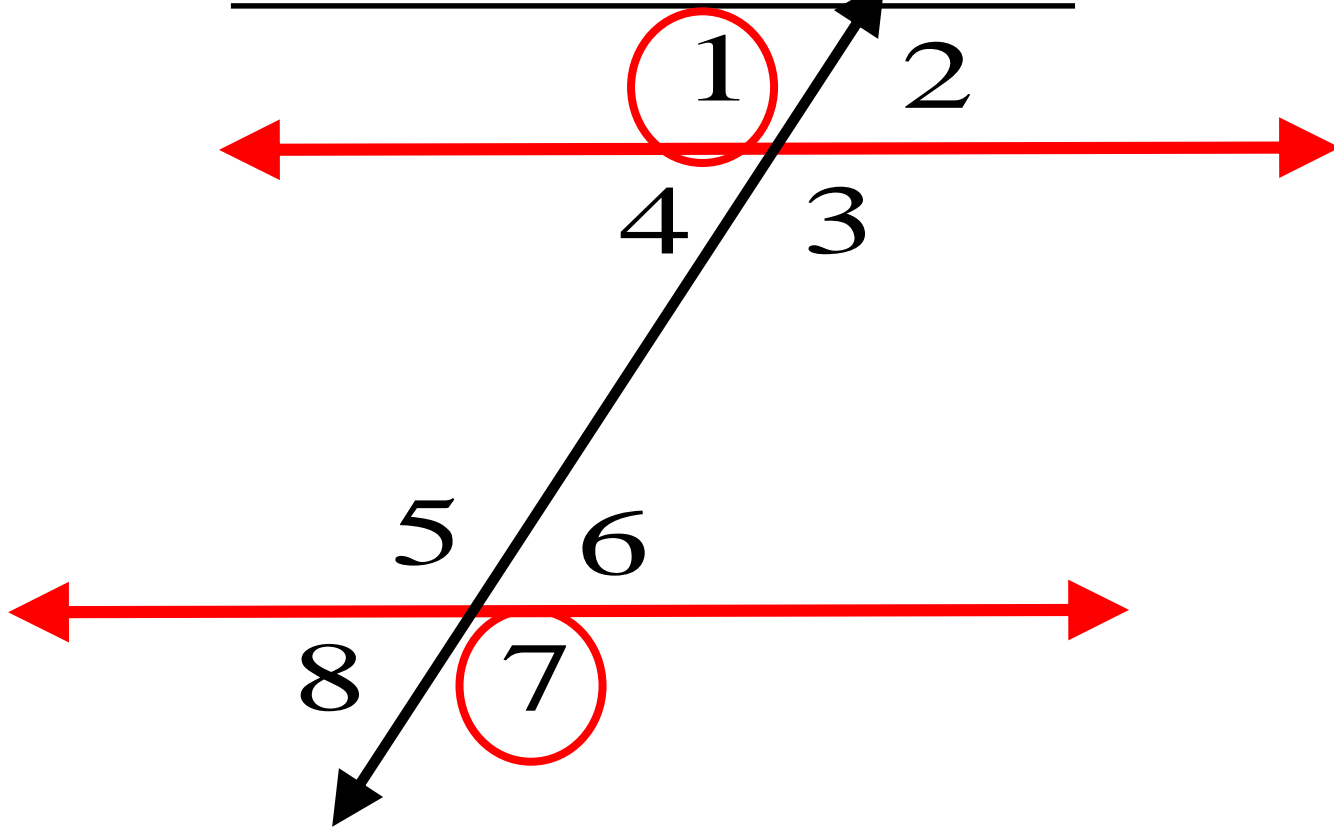
1 2

4 3

∠4, ∠6

Name the one other alternate interior angle pair.

5 6

8 7

∠3, ∠5

Alternate Exterior Angles: pairs of angles that are <u>outside the parallel lines</u> and on <u>alternate sides of the transversal.</u>
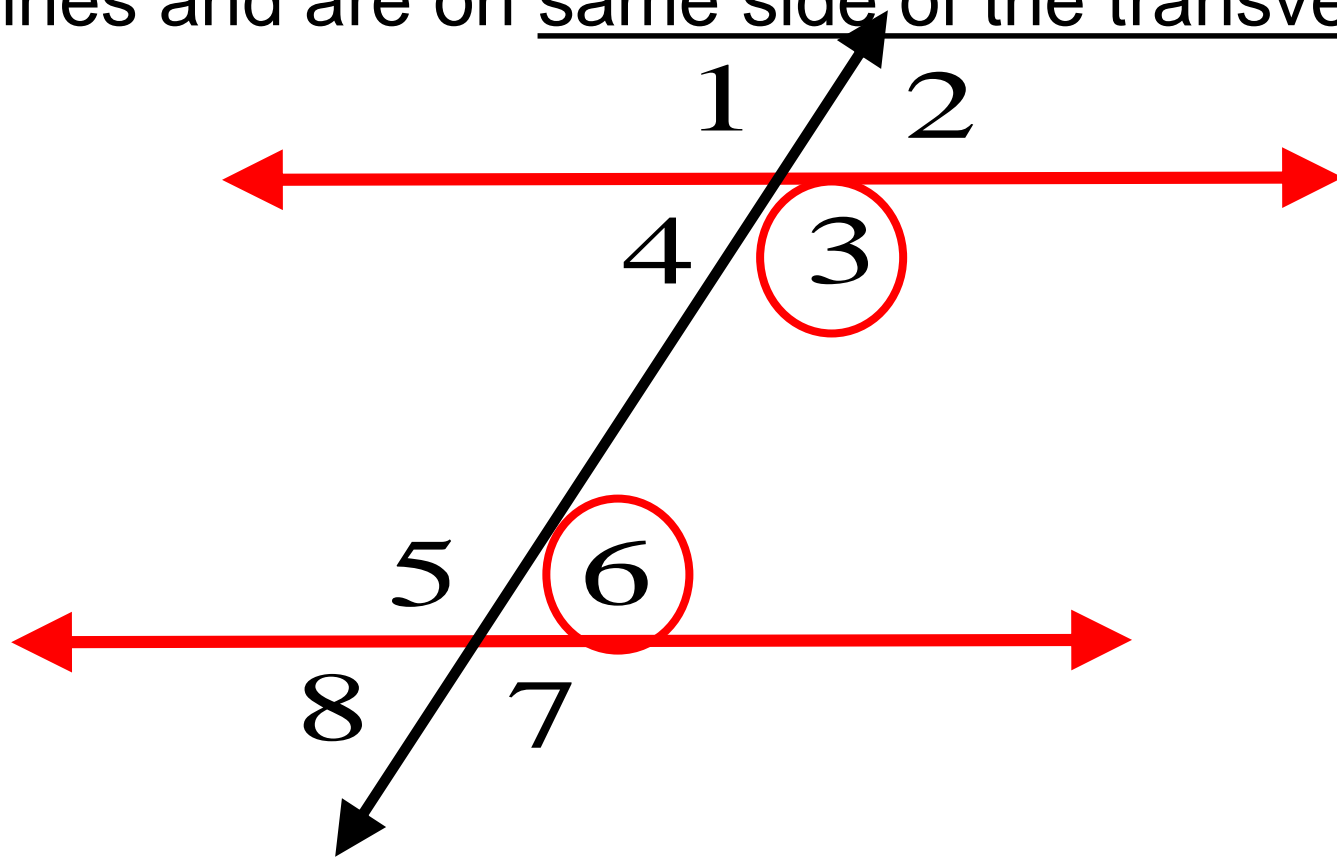
$\angle 1, \angle 7$

Name the <u>one other</u> <u>alternate exterior angle pair.</u>

$\angle 2, \angle 8$

Consecutive Interior Angles: pairs of angles that are in between the parallel lines and are on same side of the transversal.
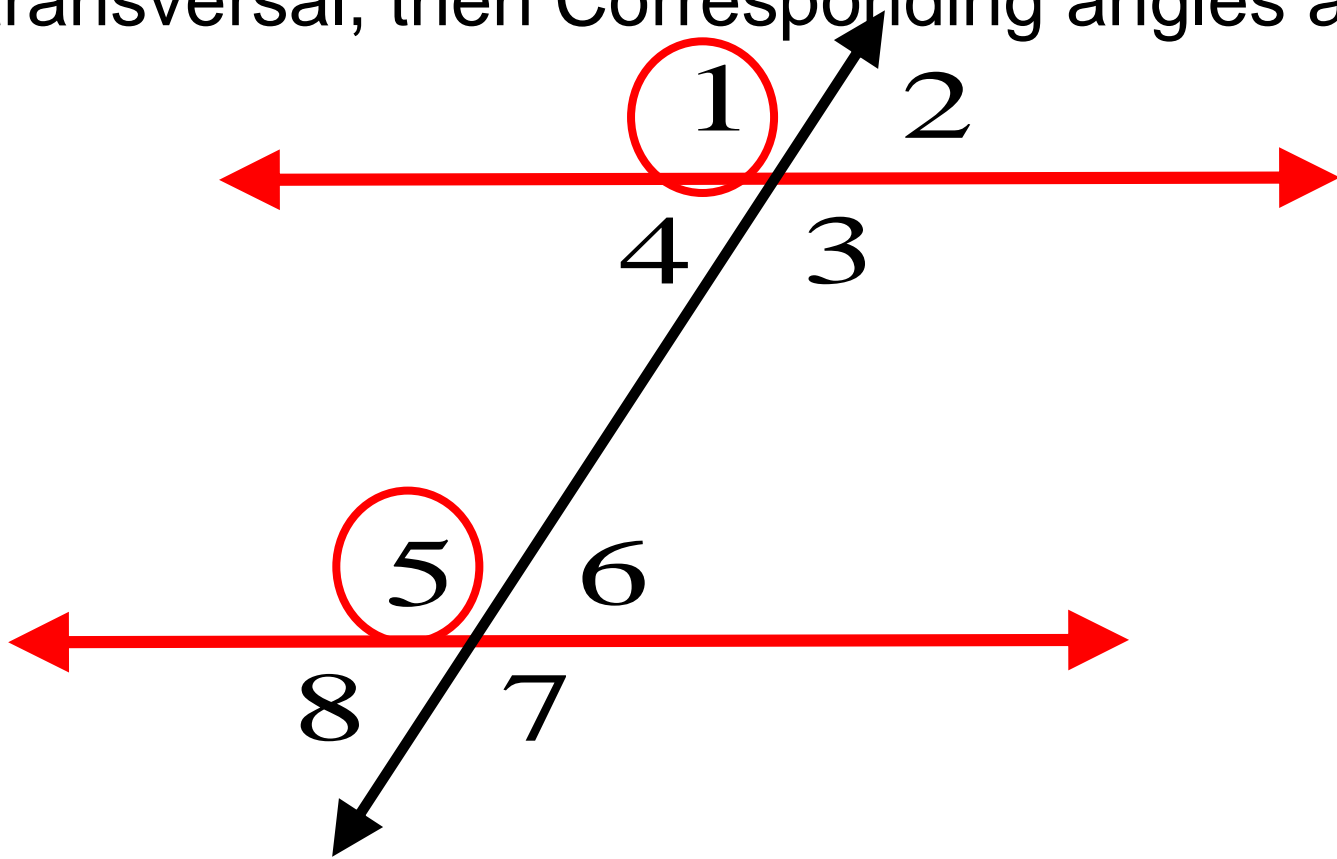

$\angle 3, \angle 6$

Name the one other consecutive interior angle pair.

$\angle 4, \angle 5$

Corresponding Angles Postulate: If two parallel lines are cut by a transversal, then Corresponding angles are congruent.

$$m\angle 1 = m\angle 5$$

$$m\angle 2 = m\angle 6$$

$$m\angle 3 = m\angle 7$$

$$m\angle 4 = m\angle 8$$

The two red lines are parallel. Find the measures of all the other angles.

$m\angle 2 =$ ___130°___ (Linear pair) $m\angle 4 =$ ___50°___ (vertical angle pair)

$m\angle 3 =$ ___130°___ (vertical angle pair)

$m\angle 5 =$ ___130°___ (corresponding angles)

50°

2

4 3

$m\angle 6 =$ ___50°___ (linear pair)

$m\angle 7 =$ ___130°___ (vertical angle pair)

5 6

$m\angle 8 =$ ___50°___ (vertical angle pair)

8 7
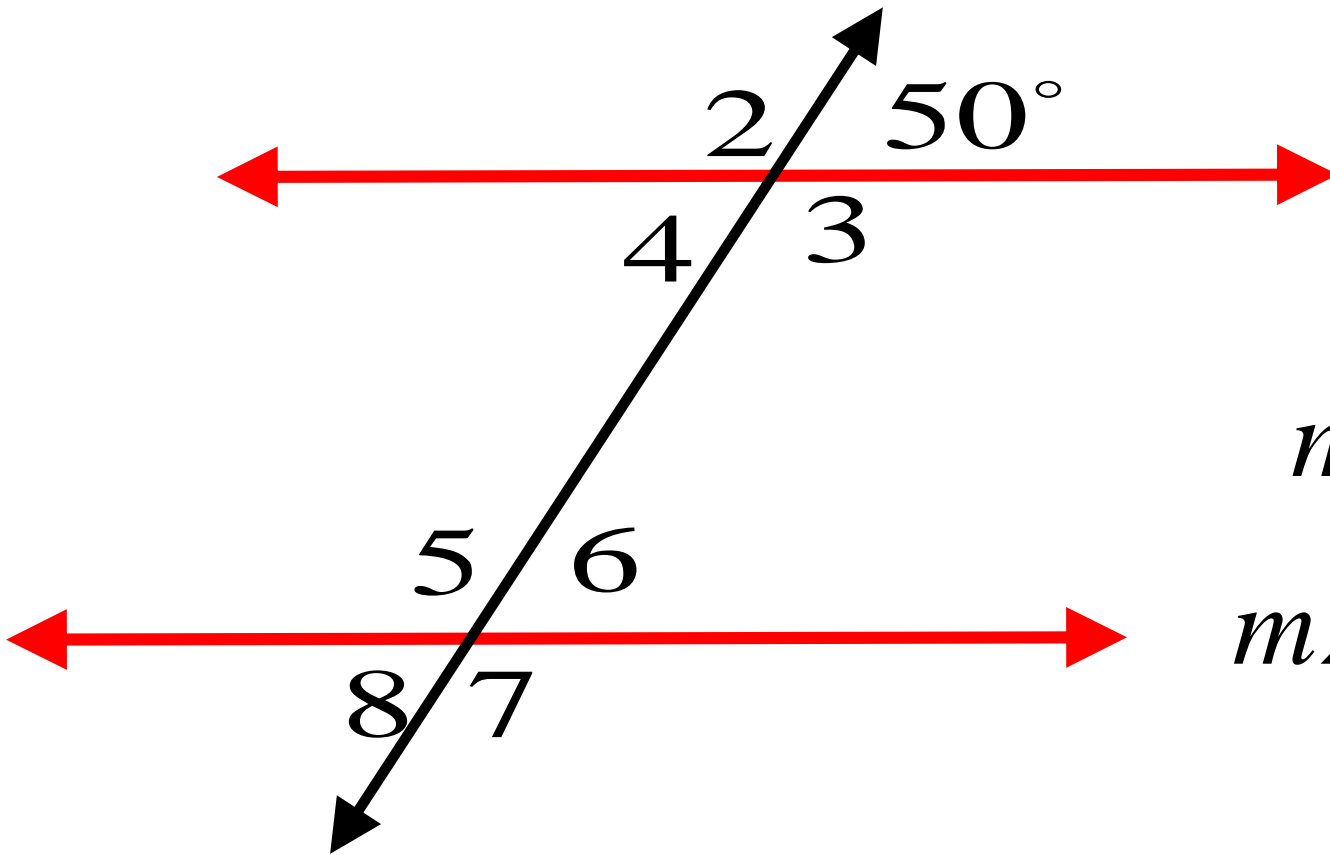
The two red lines are parallel, what can you say about ...
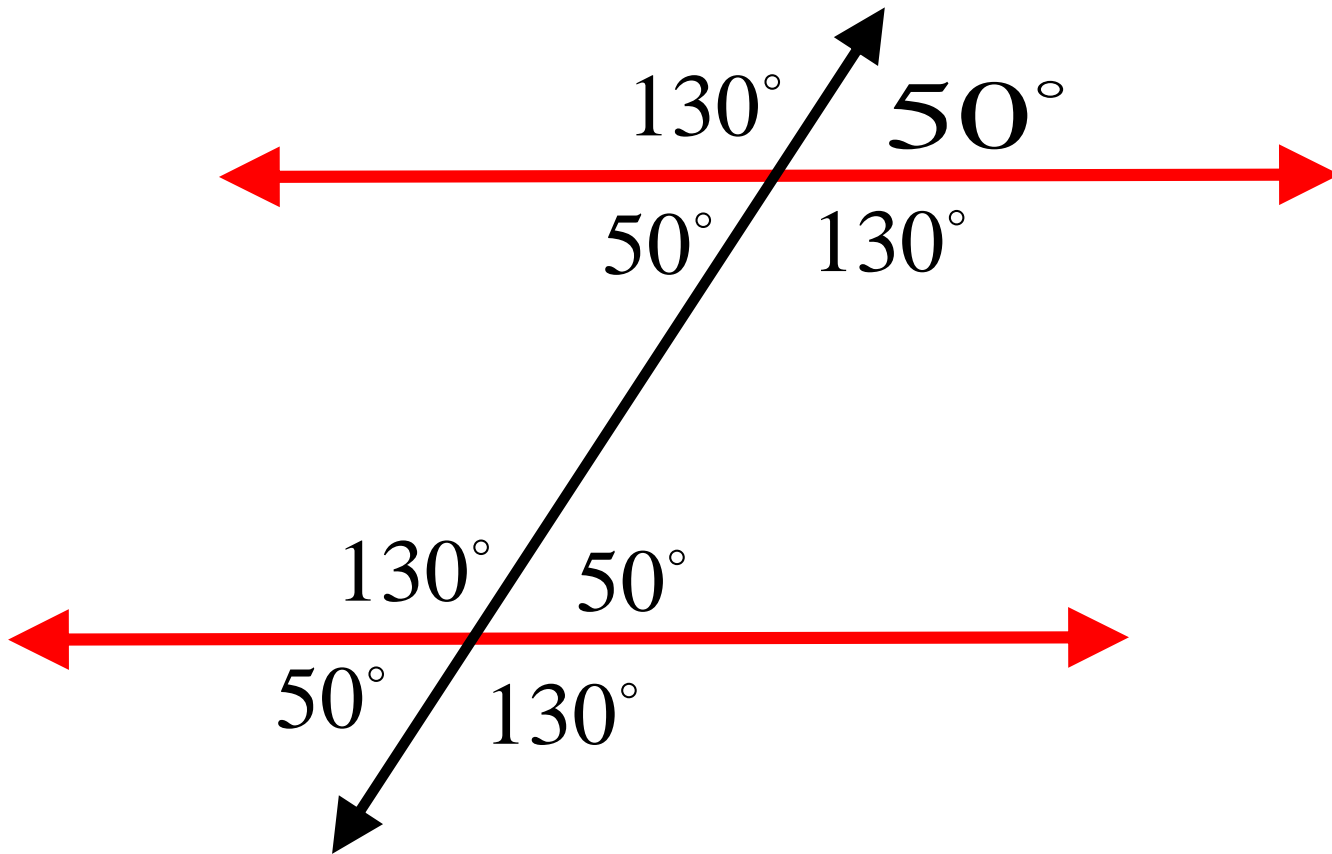
Linear Angle Pairs: supplementary

Vertical angle pair: congruent

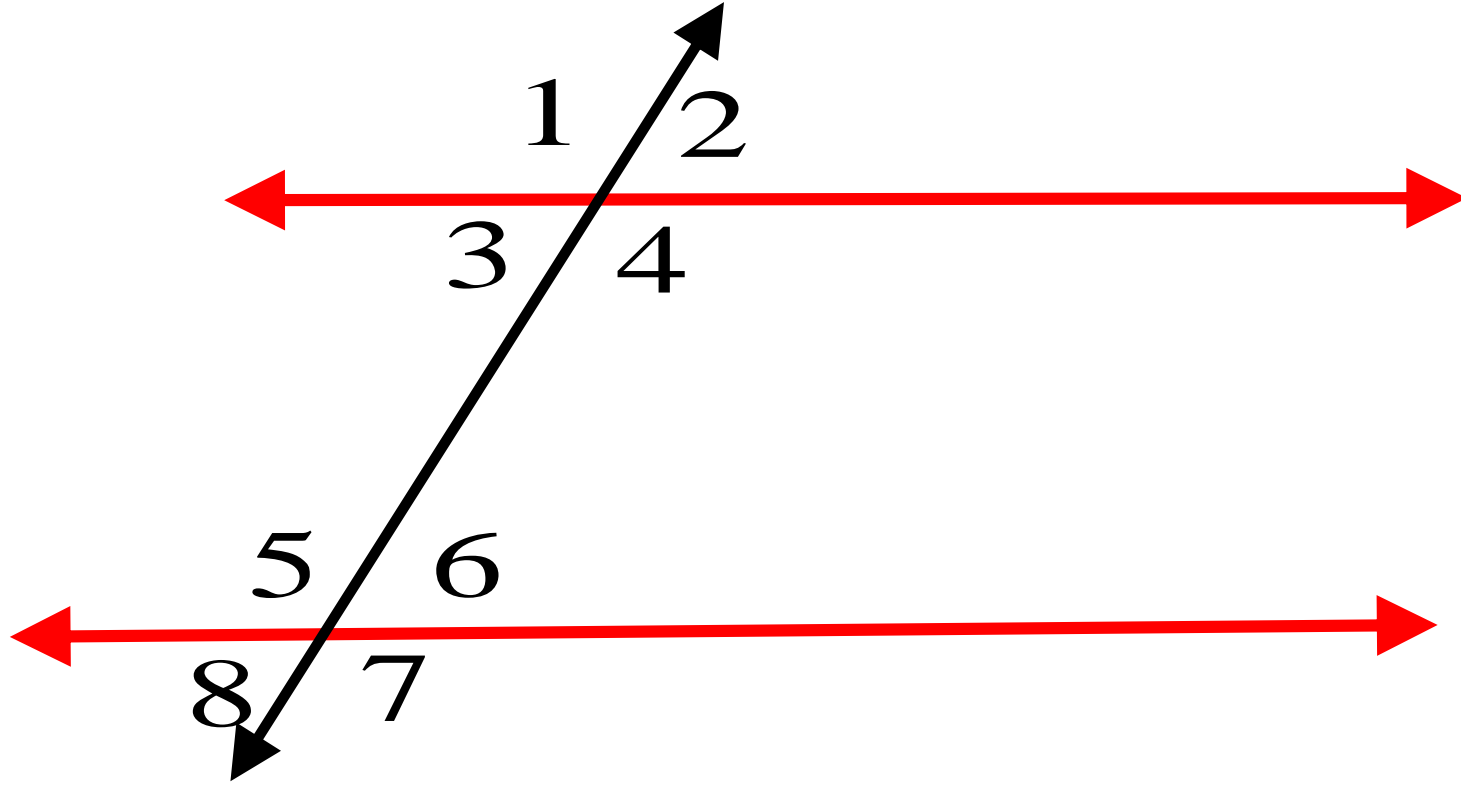Alternate Interior Angles: congruent

Consecutive Interior Angles supplementary
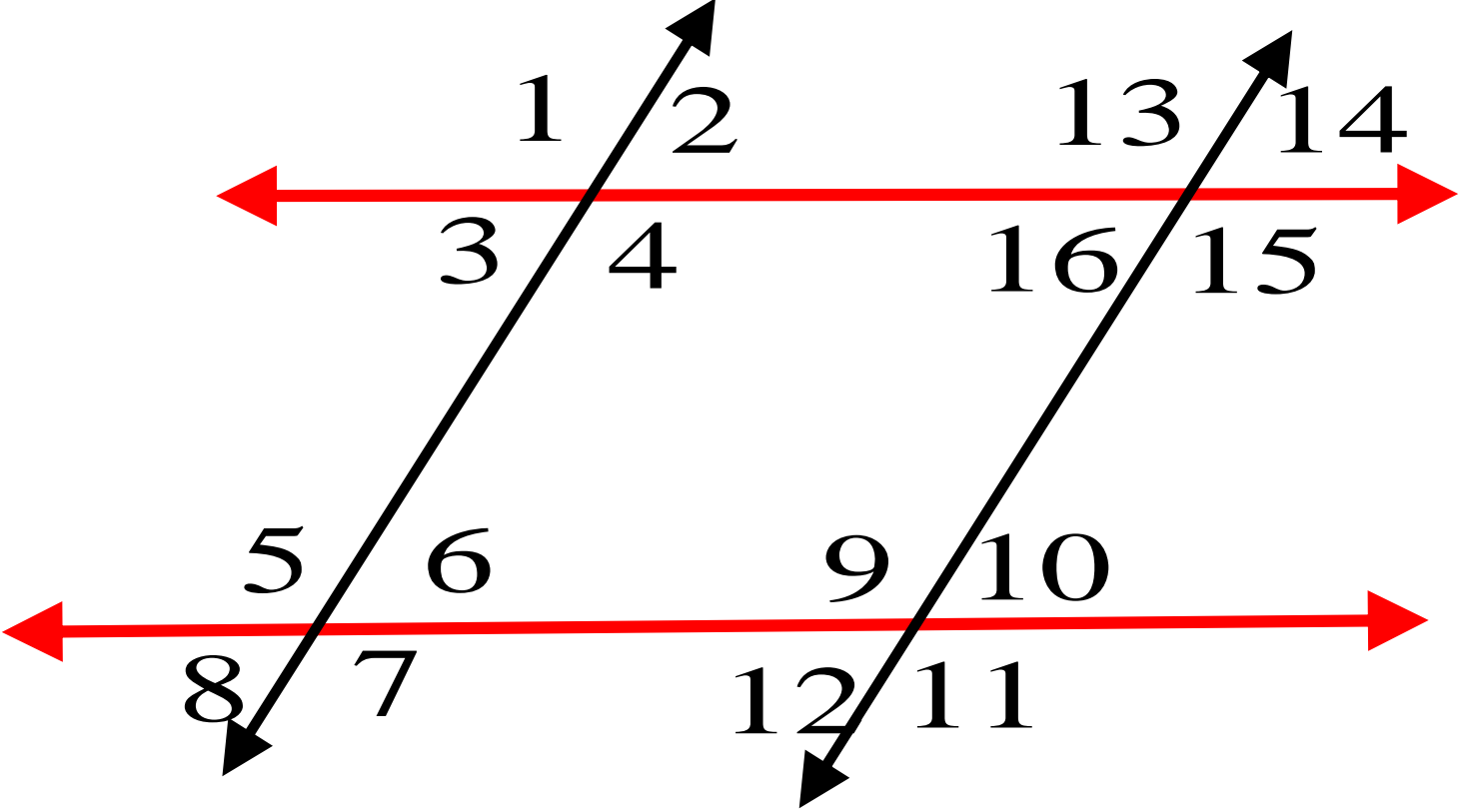
Corresponding Angles: congruent
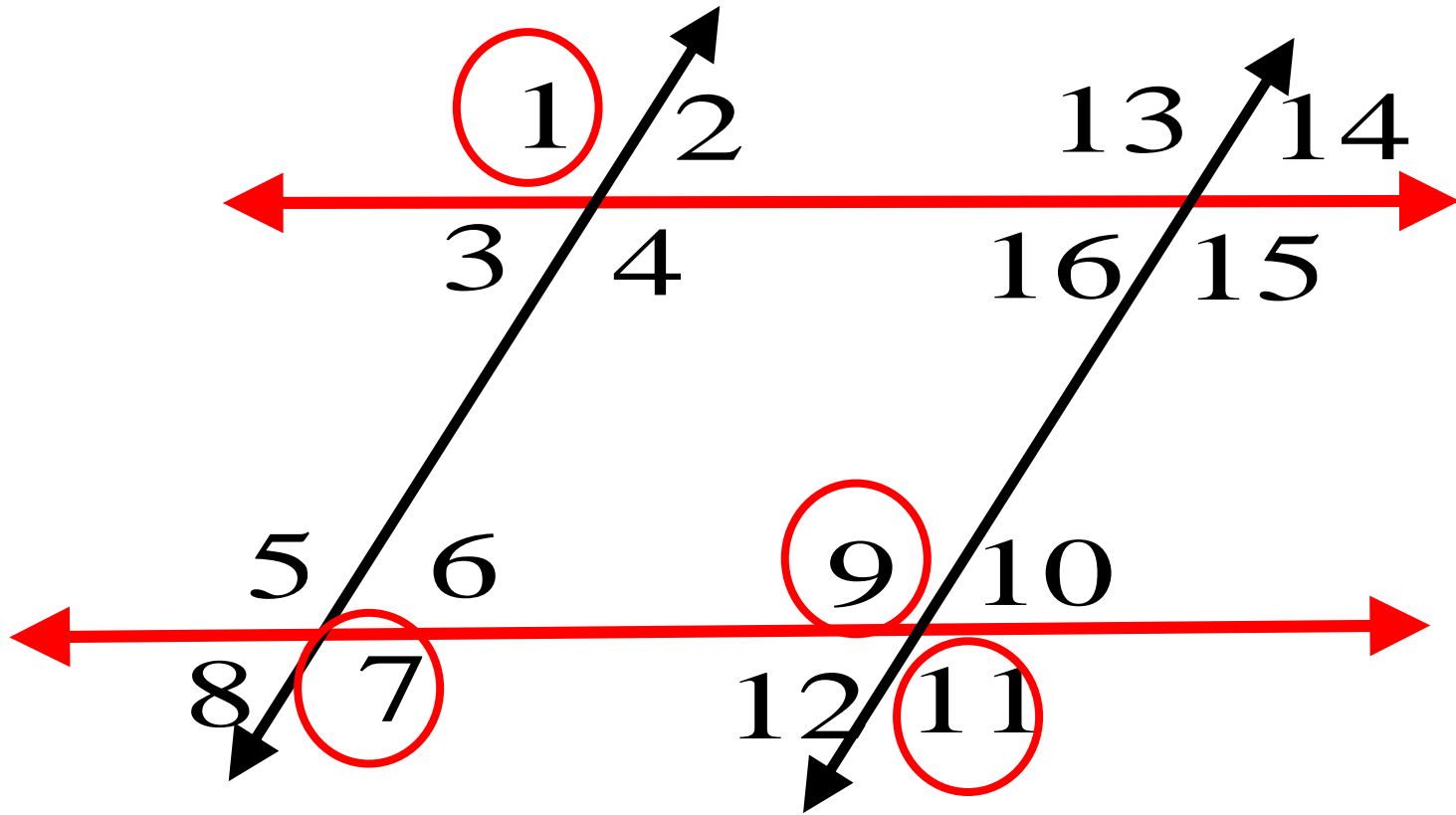
Alternate Exterior Angles: congruent

One pair of parallel lines

Two pairs of parallel lines

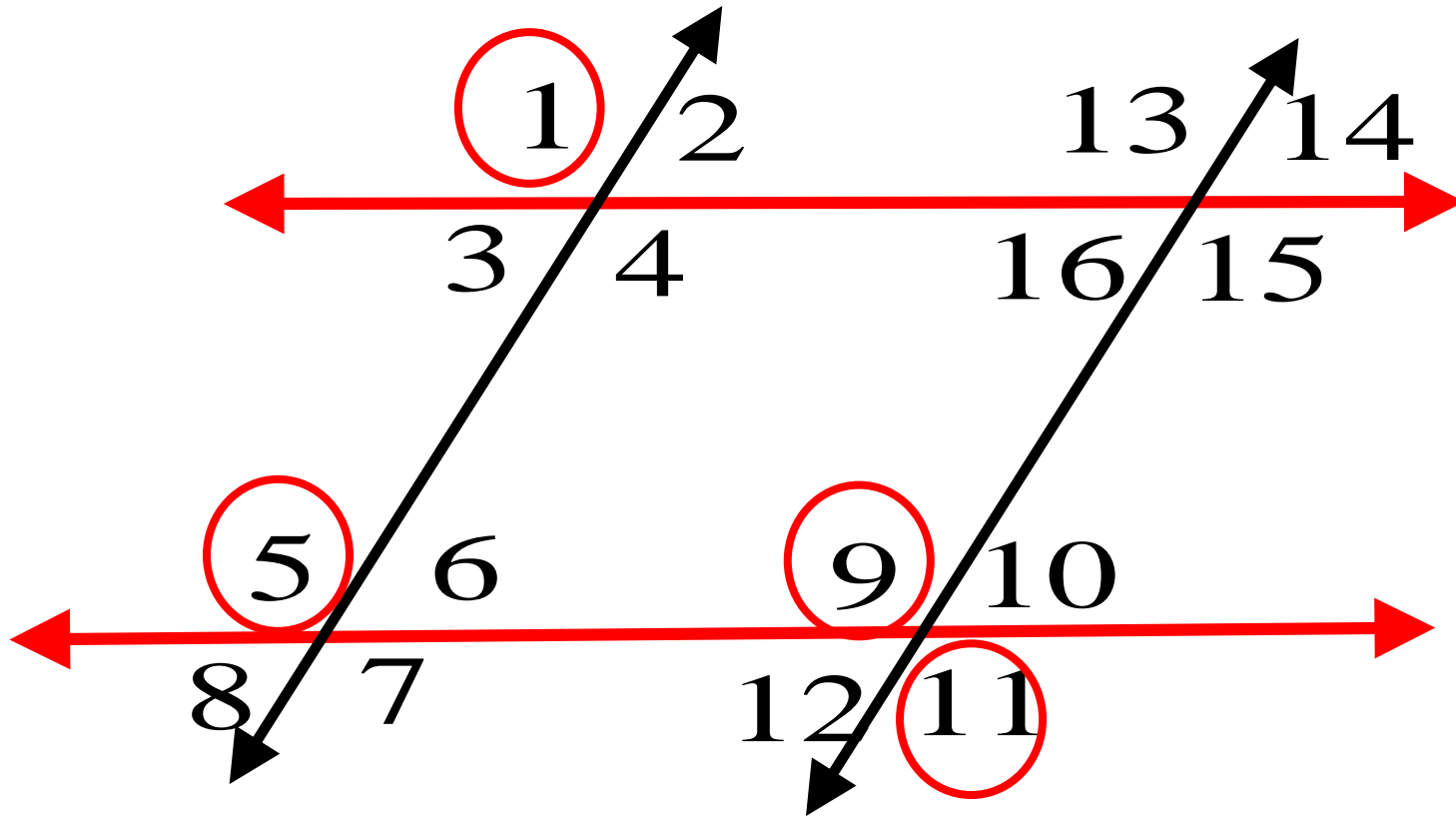What sequence of angles would you "link" to prove $m\angle 1 = m\angle 11$

Alternate Exterior

Alternate Interior

Vertical

What sequence of angles would you "link" to prove $m\angle 1 = m\angle 11$

Corresponding

Corresponding

Vertical