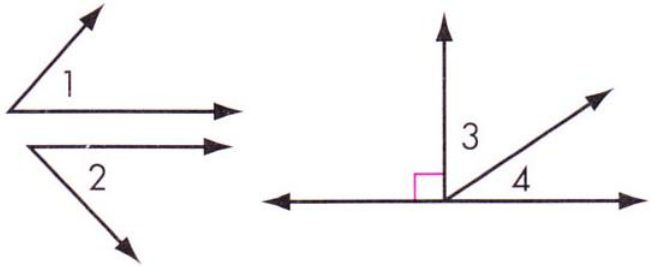
3.1

PARALLEL LINES AND TRANSVERSALS

1) Define complementary angles

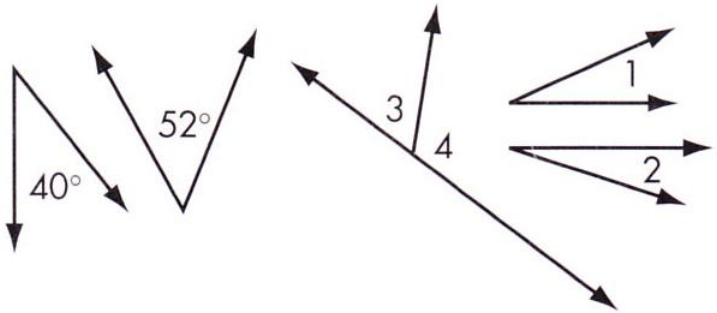
Pairs of complementary angles



$m\angle 1 + m\angle 2 = 90^\circ$

$m\angle 3 + m\angle 4 = 90^\circ$

Not pairs of complementary angles

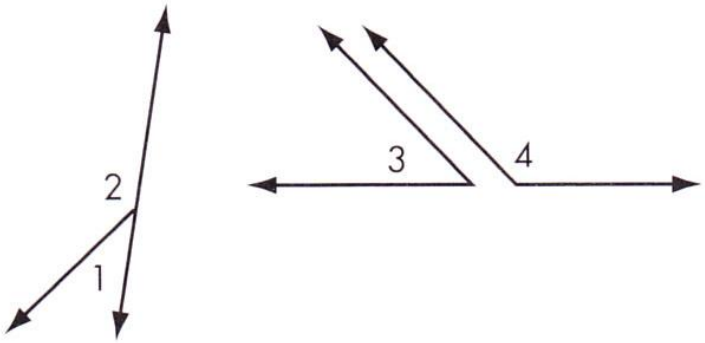


$m\angle 1 + m\angle 2 < 90^\circ$

Note: Sometimes it's convenient to name angles in a diagram with a number.

2) Define supplementary angles

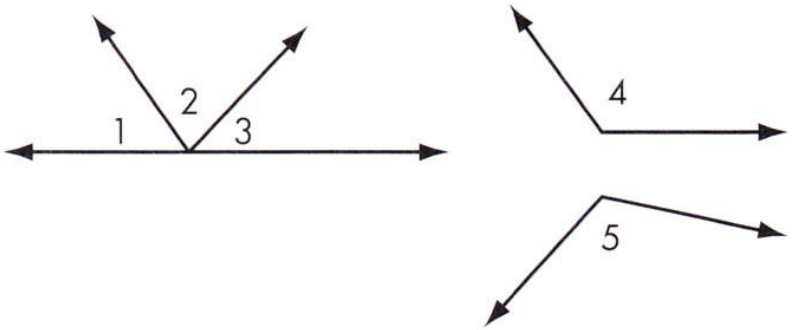
Pairs of supplementary angles



$m\angle 1 + m\angle 2 = 180^\circ$

$m\angle 3 + m\angle 4 = 180^\circ$

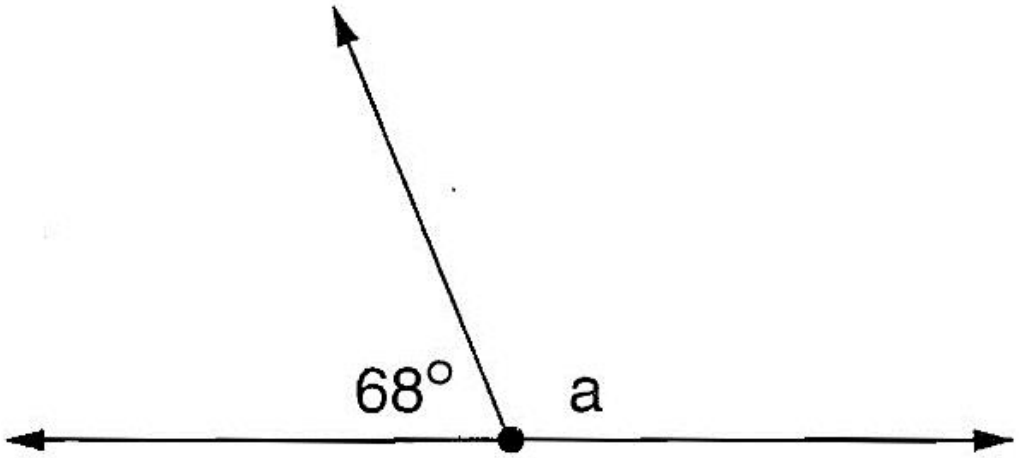
Not pairs of supplementary angles



$m\angle 1 + m\angle 2 < 180^\circ$

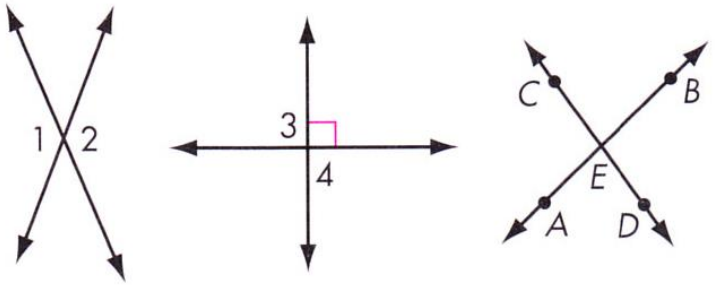
$m\angle 4 + m\angle 5 > 180^\circ$

Find the missing angle.



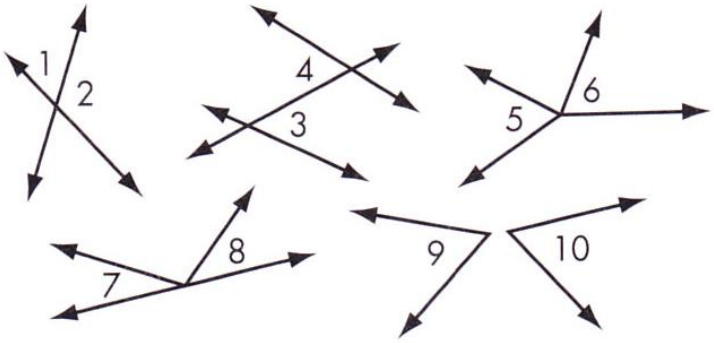
3) Define vertical angles

Pairs of vertical angles



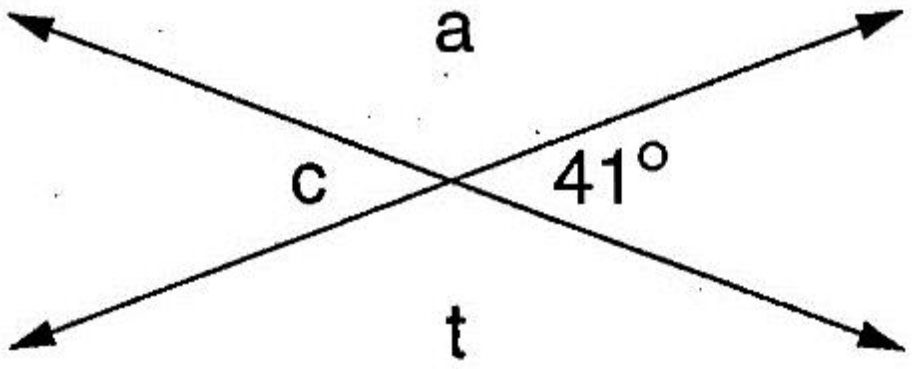
$\angle 1$ and $\angle 2$ are a pair of vertical angles.
$\angle 3$ and $\angle 4$ are also vertical angles.
$\angle AED$ and $\angle BEC$ are also vertical angles.

Not pairs of vertical angles



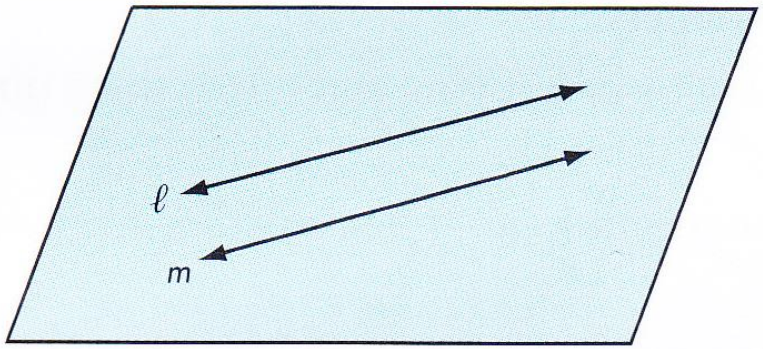
$\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, $\angle 7$ and $\angle 8$, and $\angle 9$ and $\angle 10$ are not pairs of vertical angles.

Find the missing angles.



4) Define parallel lines

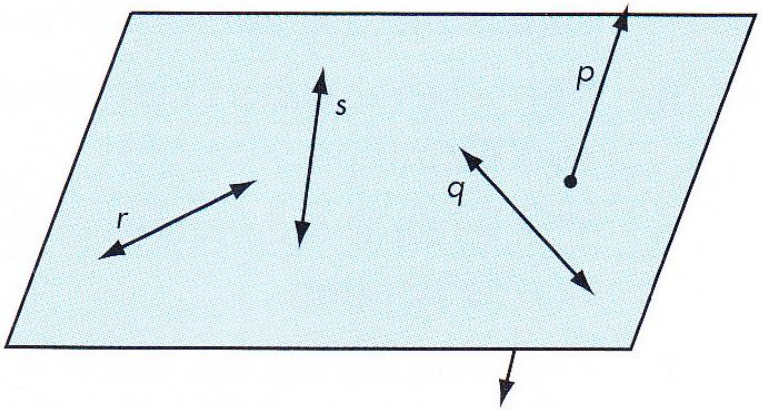
Parallel lines



$\ell \parallel m$

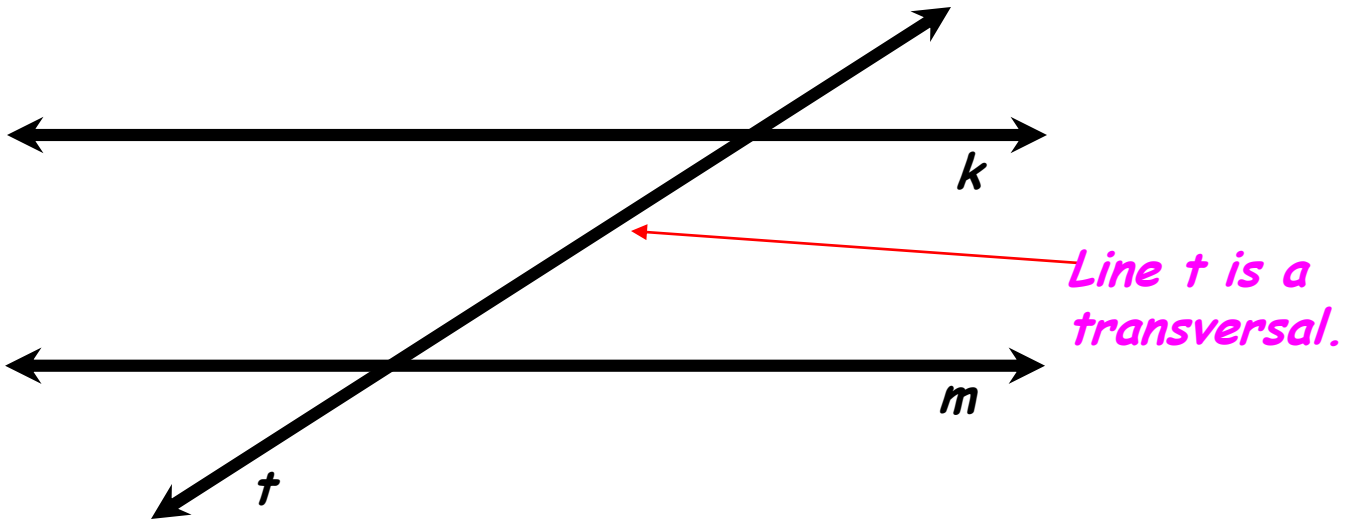
Note: Lines are sometimes labeled and named with lowercase letters. The symbol $\parallel$ means "is parallel to."

Not parallel lines



Line r is not parallel to line s.
Line p is not parallel to line q.
Note: Lines p and q are not in the same plane. Such lines are called **skew** lines.

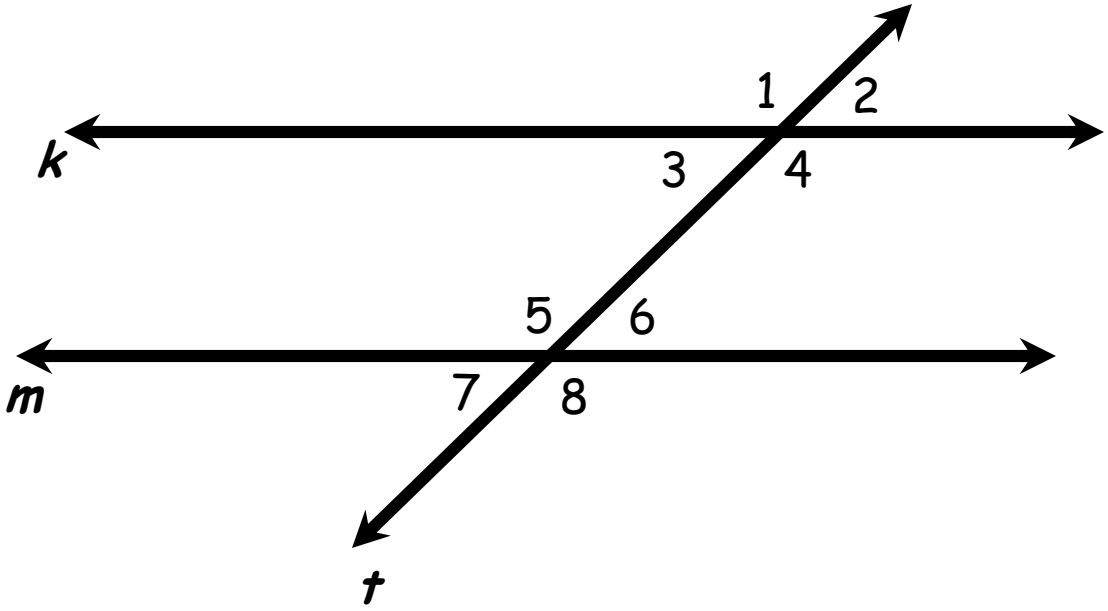
What is a transversal?



A line that intersects two or more lines in different points.

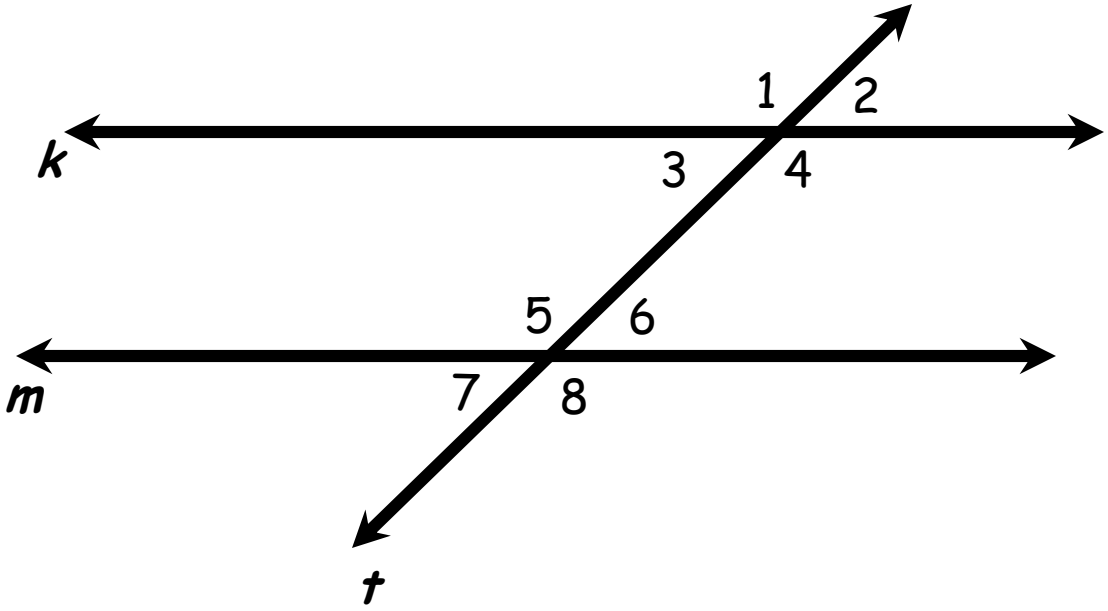
Corresponding Angles

Helpful Letter



Corresponding angles lie on the _____ of the transversal and in _____ positions.

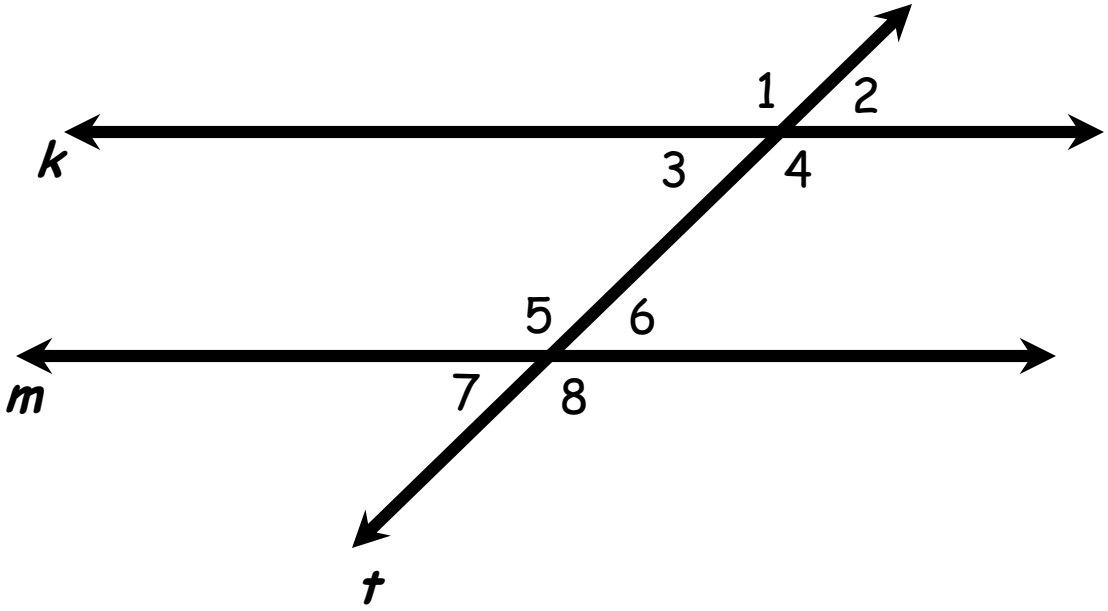
Alternate Interior Angles



Helpful Letter

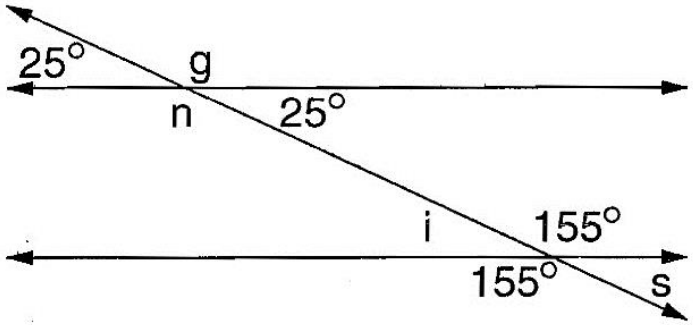
Alternate interior angles lie on the _____ of the transversal. They are _____ the two lines being crossed.

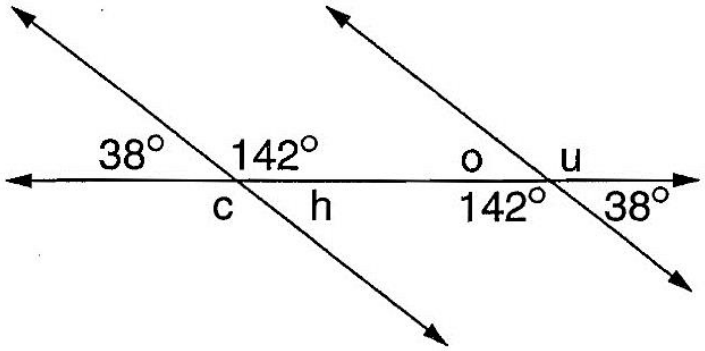
Alternate Exterior Angles

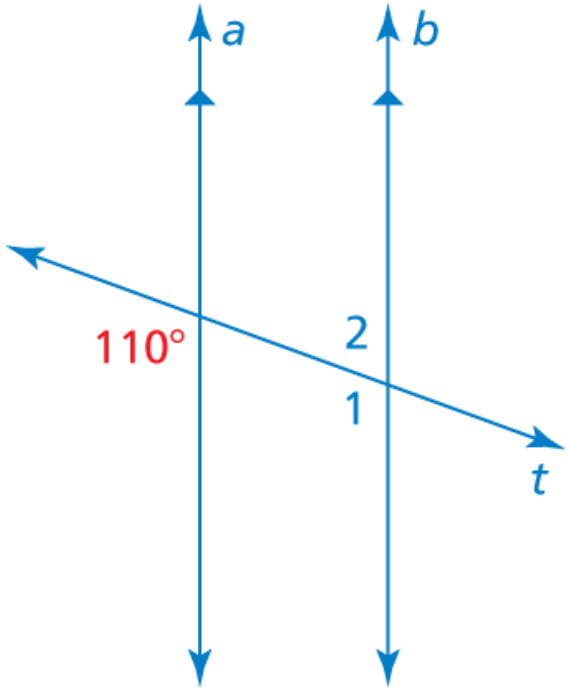


Alternate exterior angles lie on the _____ of the transversal. They are _____ the two lines being crossed.

Find the missing angles.





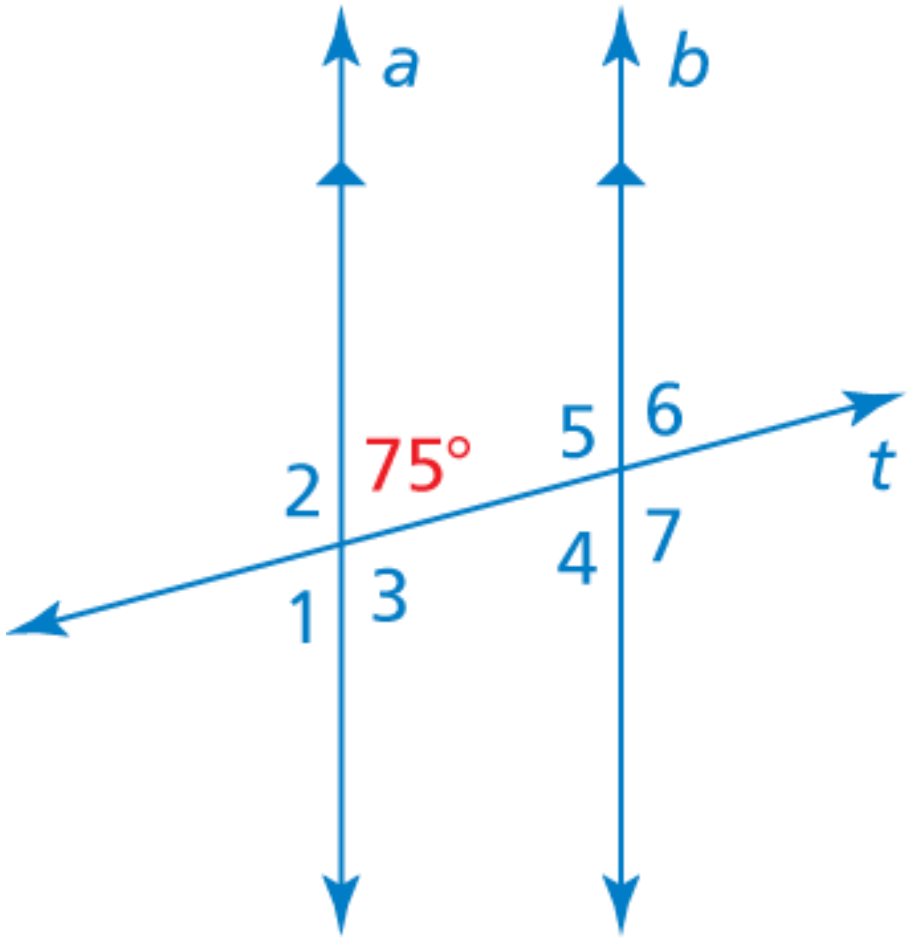


Use the figure to find the measures of (a) $\angle 1$ and (b) $\angle 2$.

a.

b.

Use the figure to find the measures of the numbered angles.



The photo shows a portion of an airport. Describe the relationship between each pair of angles.

a. $\angle 3$ and $\angle 6$

b. $\angle 2$ and $\angle 7$