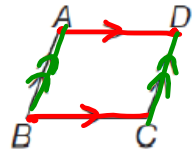
7.5

Classifying Lines & Angles

Try These

Name the parallel sides in each quadrilateral.

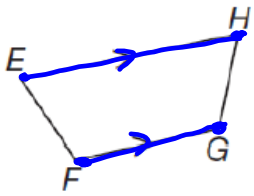
i)



AD ∥ BC

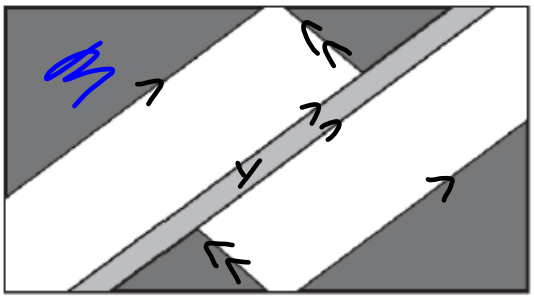
AB ∥ DC

ii)



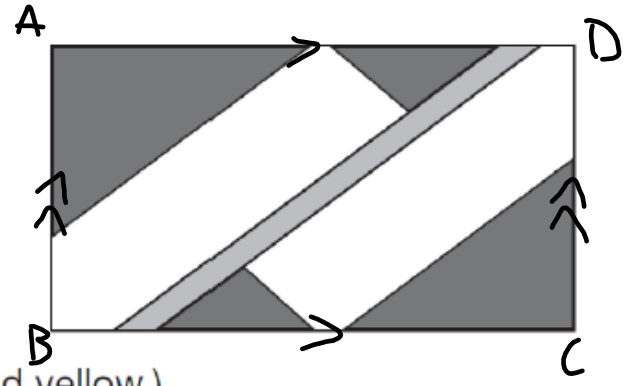
EH ∥ FG

Many flags show parallel lines, which are always the same distance apart, and perpendicular lines, which are at right angles. This is the flag of the Franco-Yukonnais community—the French Canadian residents of Yukon. (The colours are blue, white, and yellow.)



1. Which lines inside the flag are parallel? Mark them using matching arrowheads.

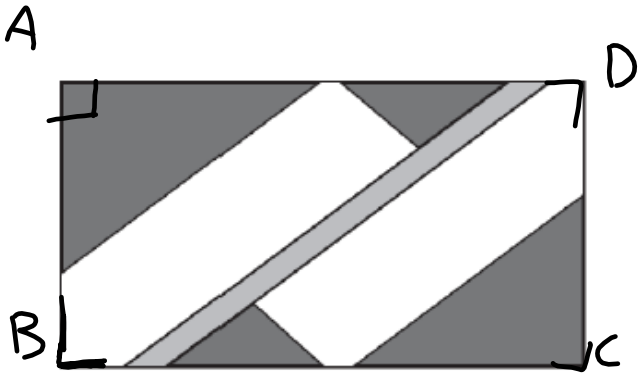
Many flags show parallel lines, which are always the same distance apart, and perpendicular lines, which are at right angles. This is the flag of the Franco-Yukonnais community—the French Canadian residents of Yukon. (The colours are blue, white, and yellow.)

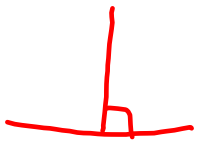


2. Label the corners of the rectangular flag *ABCD*. Then name two pairs of parallel sides. _____

AB ∥ CD or AD ∥ BC

Many flags show parallel lines, which are always the same distance apart, and perpendicular lines, which are at right angles. This is the flag of the Franco-Yukonnais community—the French Canadian residents of Yukon. (The colours are blue, white, and yellow.)





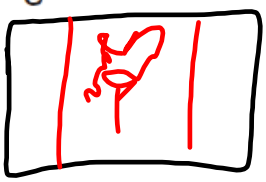
3 Name two pairs of perpendicular sides

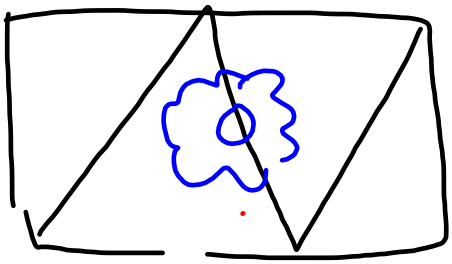
AB ⊥ BC

BC ⊥ DA

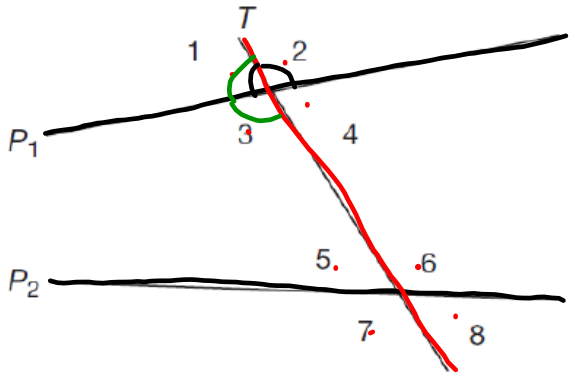
4 Complete the following statement: In a rectangle, the opposite sides are parallel, and the adjacent sides are perpendicular.

5 Draw a flag that does *not* include parallel or perpendicular lines in its interior design.



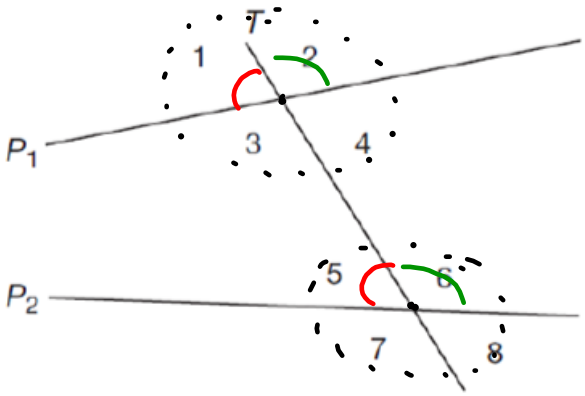


Many angles are formed by two lines and a **transversal**.
Below, lines P_1 and P_2 are intersected by T, a transversal.



6 Name all eight pairs of adjacent supplementary angles.

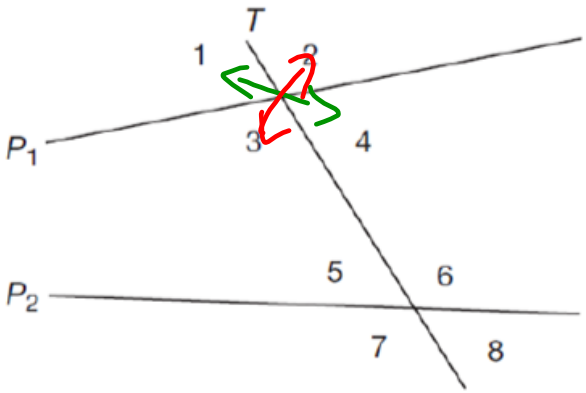
∠1 & ∠2
∠3 & ∠4
∠1 & ∠3
∠2 & ∠4
∠5 & ∠6
∠7 & ∠8
∠5 & ∠7
∠6 & ∠8



corresponding angles
two angles formed by two lines and a transversal and located on the *same* side of the transversal

Pairs of angles can be described in other ways.
For example:

- **corresponding angles**: ∠1 and ∠5, ∠2 and ∠6
  (These pairs are *above* or *below* lines P_1 and P_2.)

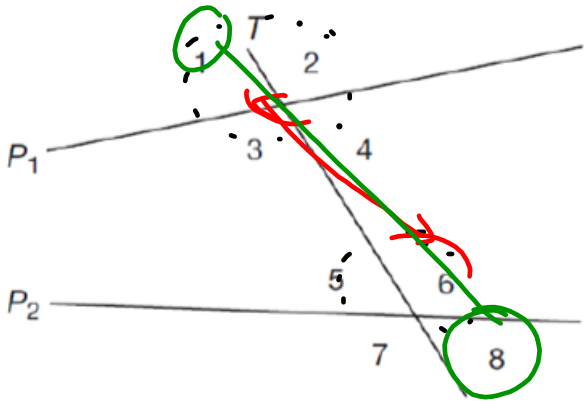


Pairs of angles can be described in other ways.
For example:

- **corresponding angles**: ∠1 and ∠5, ∠2 and ∠6
  (These pairs are *above* or *below* lines P_1 and P_2.)
- **opposite angles**: ∠1 and ∠4, ∠2 and ∠3
  (These are around an intersection point.)

corresponding angles
two angles formed by two lines and a transversal and located on the *same* side of the transversal

opposite angles
non-adjacent angles that are formed by two intersecting lines



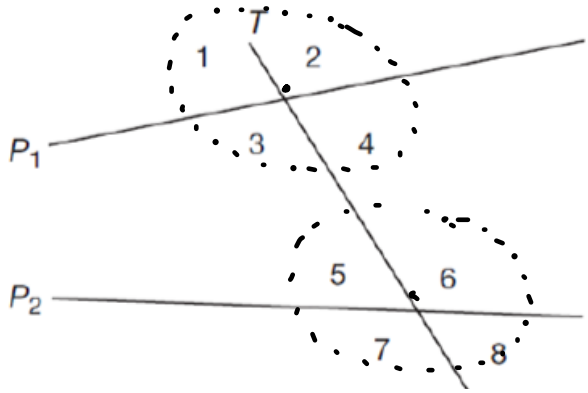
Pairs of angles can be described in other ways.
For example:

- **corresponding angles**: ∠1 and ∠5, ∠2 and ∠6
  (These pairs are *above* or *below* lines P_1 and P_2.)
- **opposite angles**: ∠1 and ∠4, ∠2 and ∠3
  (These are around an intersection point.)
- **alternate** interior **angles**: ∠3 and ∠6
  (These pairs are *inside* lines P_1 and P_2.)
- **alternate** exterior **angles**: ∠1 and ∠8
  (These pairs are *outside* lines P_1 and P_2.)

corresponding angles
two angles formed by two lines and a transversal and located on the *same* side of the transversal

opposite angles
non-adjacent angles that are formed by two intersecting lines

alternate angles
two angles formed by two lines and a transversal and located on *opposite* sides of the transversal



Example

What other pairs of corresponding angles, opposite angles, and alternate angles are in the diagram above?

Solution

A. corresponding angles: $\angle 1 \cong \angle 5$, $\angle 3 \cong \angle 7$, $\angle 2 \cong \angle 6$, $\angle 4 \cong \angle 8$

B. opposite angles: $\angle 1 \cong \angle 4$, $\angle 3 \cong \angle 2$, $\angle 5 \cong \angle 8$, $\angle 6 \cong \angle 7$

C. alternate interior angles: $\angle 3 \cong \angle 6$, $\angle 4 \cong \angle 5$

D. alternate exterior angles: $\angle 1 \cong \angle 8$, $\angle 2 \cong \angle 7$