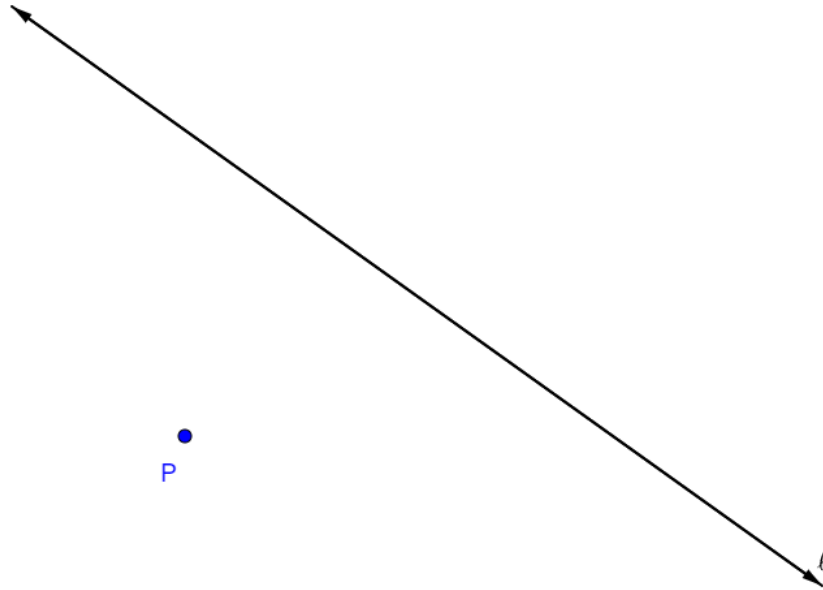


Activity 1: Constructions

Using only a compass and straight edge, construct the line parallel to ℓ through point P . Leave all of your arcs and markings, and label your points.



Using only a compass and straight edge, construct the line perpendicular to m through point P . Leave all of your arcs and markings, and label your points.



Activity 2: Proving lines are parallel

1. Given the following information, determine which lines, if any, are parallel.

Your answers will be "a ∥ b" or "ℓ ∥ m."

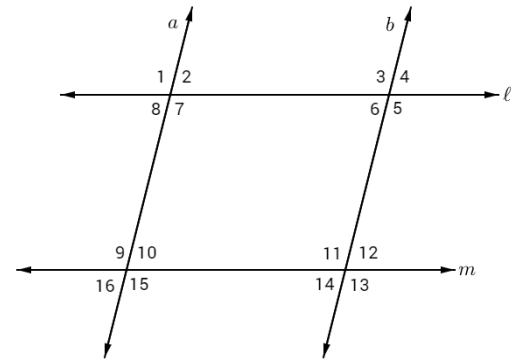
a. $\angle 3 \cong \angle 7$

b. $\angle 9 \cong \angle 11$

c. $\angle 4 \cong \angle 16$

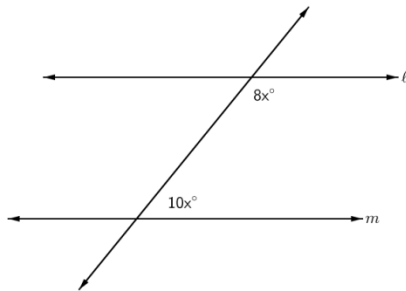
d. $m\angle 5 + m\angle 12 = 180^\circ$

e. $\angle 4 \cong \angle 13$

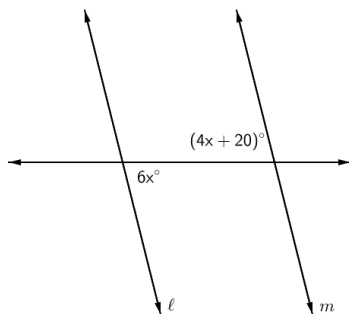


2. Find x so that line ℓ is parallel to line m .

a.



b.

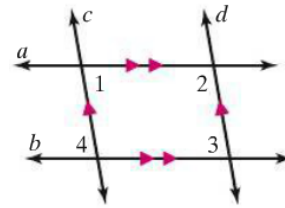


Activity 3: Complete the Proofs

Complete the following proofs about parallel lines.

Given: $a \parallel b, c \parallel d$

Prove: $\angle 1 \cong \angle 3$

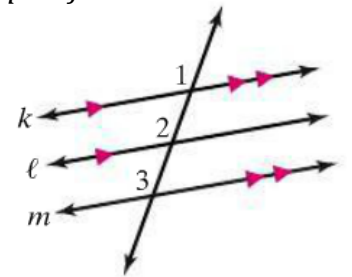


Statements	Reasons
1.	1.
2. $\angle 3$ and $\angle 2$ are supplementary.	2.
3.	3. Given
4. $\angle 1$ and $\angle 2$ are supplementary.	4.
5. $\angle 1 \cong \angle 3$	5.

*Note: in the next example we are **proving** the statement “If two distinct lines are both parallel to a third line, then they are parallel to each other.” This means we can’t **use** that fact during the proof.*

Given: $l \parallel k, m \parallel k$

Prove: $l \parallel m$



Statements	Reasons
1.	1.
2. $\angle 2 \cong \angle 1$	2.
3.	3. Given
4. $\angle 1 \cong \angle 3$	4.
5.	5. Transitive Property of Congruence
6. $l \parallel m$	6.

Activity 4: Parallel, Perpendicular, or Neither?

The following pairs of lines are parallel to each other, perpendicular to each other, or neither parallel nor perpendicular to each other (one of each). Determine which is which.

a. $3x + 2y = 5$
 $3y + 2x = -3$

b. $y = 6$
 $x = 2$

c. $3x - y = 2$
 $6x = 4 + 2y$