The following theorems can be proved using previous postulates and theorems. We state the theorems without proof, however, for you to use in future work.

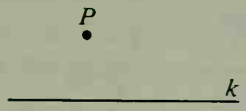
Theorem 3-8

Through a point outside a line, there is exactly one line parallel to the given line.

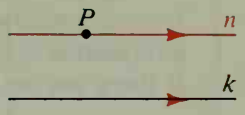
Theorem 3-9

Through a point outside a line, there is exactly one line perpendicular to the given line.

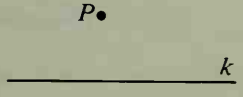
Given this:



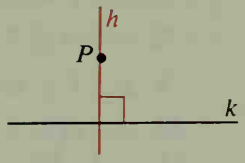
Theorem 3-8 says that line n exists and is unique.



Given this:



Theorem 3-9 says that line h exists and is unique.

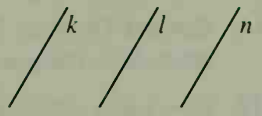


Theorem 3-10

Two lines parallel to a third line are parallel to each other.

Given: $k \parallel l$; $k \parallel n$

Prove: $l \parallel n$



In Classroom Exercise 20 you will explain why this theorem is true when all three lines are coplanar. The theorem also holds true for lines in space.

Ways to Prove Two Lines Parallel

1. Show that a pair of corresponding angles are congruent.
2. Show that a pair of alternate interior angles are congruent.
3. Show that a pair of same-side interior angles are supplementary.
4. In a plane show that both lines are perpendicular to a third line.
5. Show that both lines are parallel to a third line.