Chapter 3
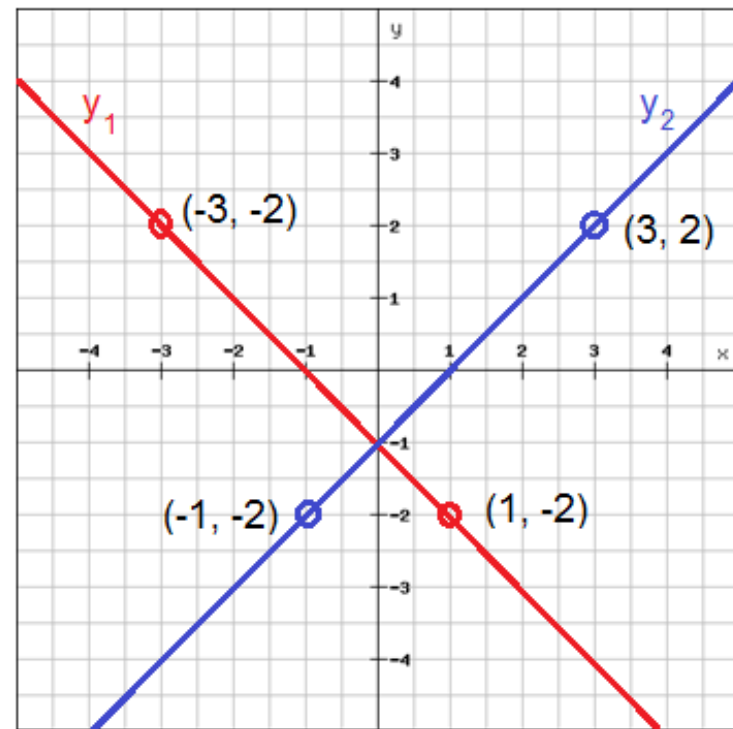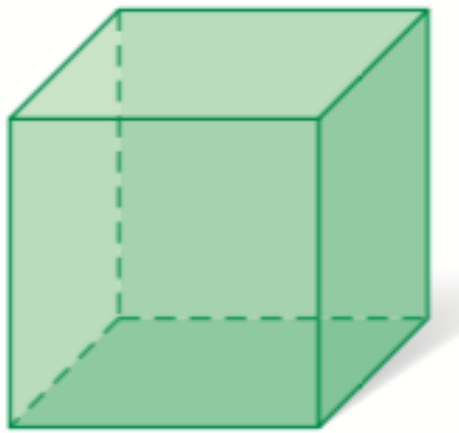# Parallel and Perpendicular Lines

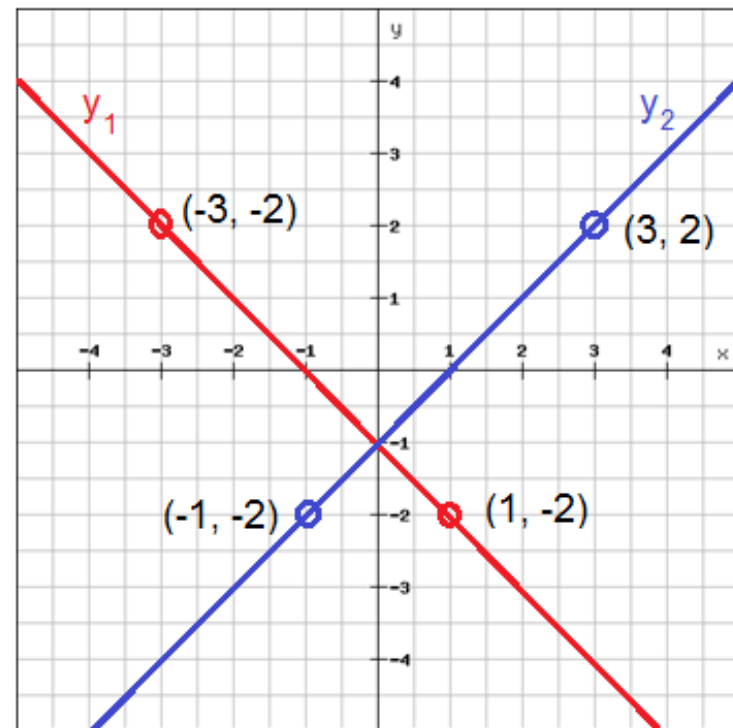# 3.4 - Proofs with Perpendicular Lines

- **Perpendicular Lines: ($\perp$):** Lines that intersect with a right angle.

3.4 - Proofs with Perpendicular Lines

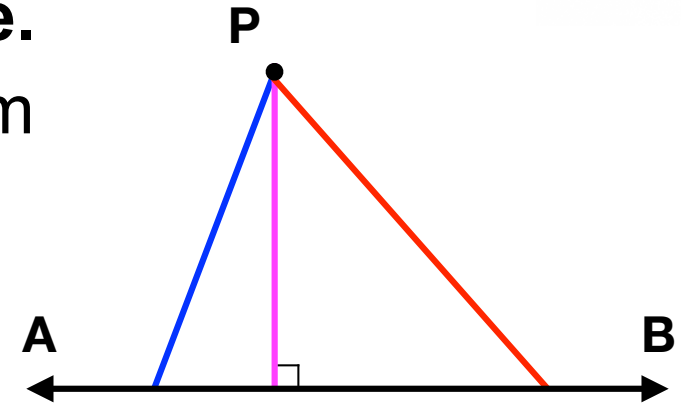- How do you determine if two lines in a coordinate plane are perpendicular?

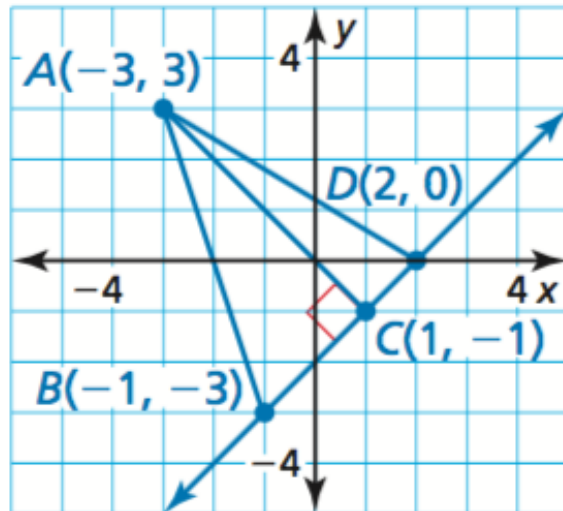# 3.4 - Proofs with Perpendicular Lines

The distance from a point to a line.

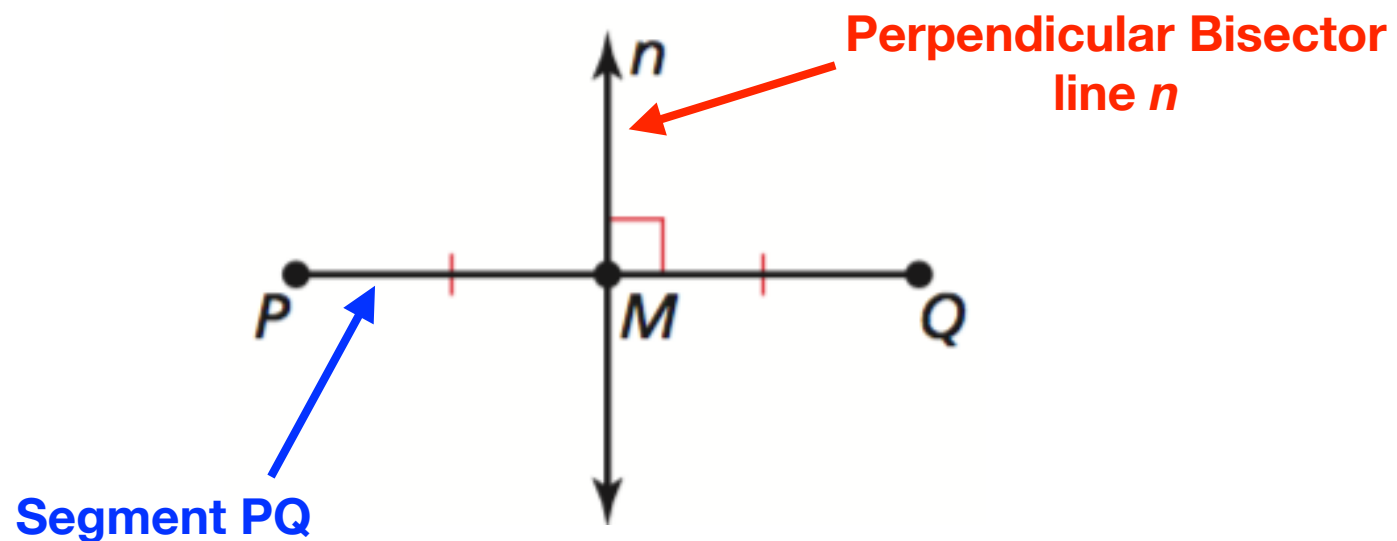- Which segment is the distance from point P to line AB?

Solve for the distance of Point A to Line BD.

3.4 - Proofs with Perpendicular Lines

- **Perpendicular Bisector:** a line that is perpendicular to a segment and passes through the midpoint of the segment.

Perpendicular Bisector line *n*

n

P

M

Q

Segment PQ

3.4 - Proofs with Perpendicular Lines

Theorems

Linear Pair Perpendicular Theorem	If two lines intersect to form a pair of congruent angles, then the lines are perpendicular.

If $\angle 1 \cong \angle 2$, then g $\perp$ h.

3.4 - Proofs with Perpendicular Lines

Theorems

Linear Pair Perpendicular Theorem	If two lines intersect to form a pair of congruent angles, then the lines are perpendicular.
Perpendicular Transversal Theorem	In a plane, if a transversal is perpendicular to one of two perpendicular lines, then it is perpendicular to the other line.

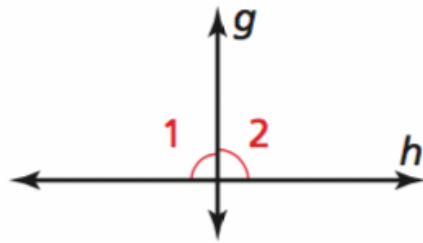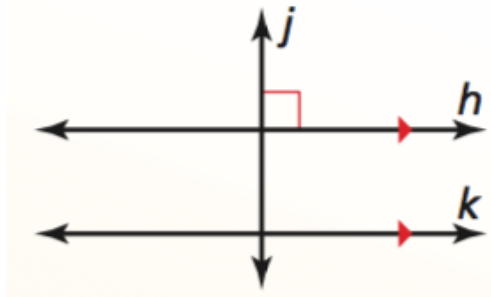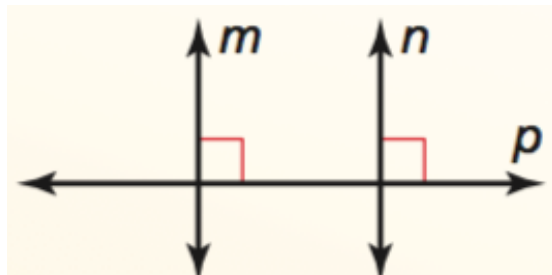If h || k and j ⊥ h, then j ⊥ k.

3.4 - Proofs with Perpendicular Lines

Theorems

Linear Pair Perpendicular Theorem	If two lines intersect to form a pair of congruent angles, then the lines are perpendicular.
Perpendicular Transversal Theorem	In a plane, if a transversal is perpendicular to one of two perpendicular lines, then it is perpendicular to the other line.
Lines Perpendicular to a Transversal Theorem	In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.

If $m \perp p$ and $n \perp p$, then $m \parallel n$.