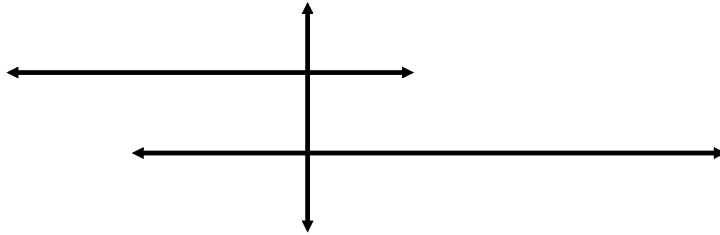




3.4: Proofs with Perpendicular Lines

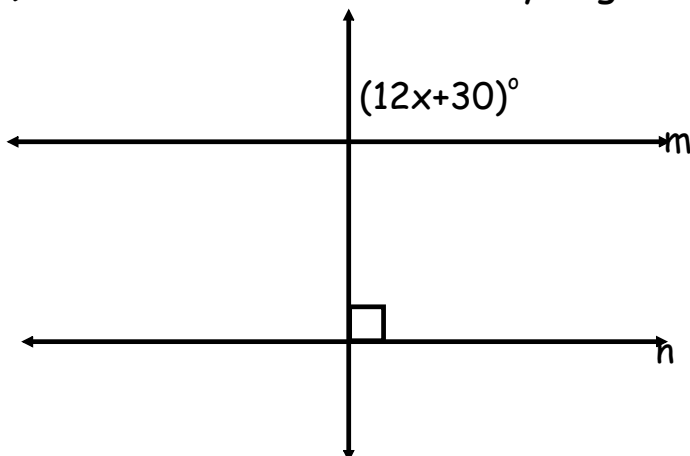
Essential Question

What conjectures can you make about perpendicular lines?



Warmup If $m \parallel n$,

- find the value of x and justify your reasoning.
- Find the measure of every angle in the diagram.

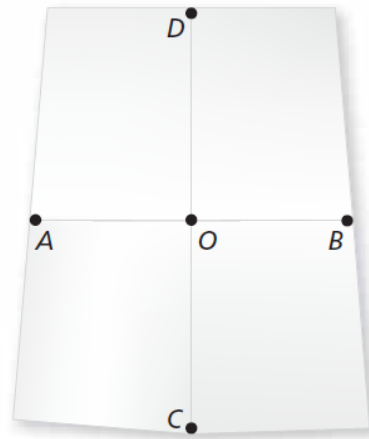


3-4-Notes-Perpendicular-Lines.notebook

Work with a partner. Fold a piece of paper in half twice. Label points on the two creases, as shown.

a. Write a conjecture about \overline{AB} and \overline{CD} . Justify your conjecture.

b. Write a conjecture about \overline{AO} and \overline{OB} . Justify your conjecture.

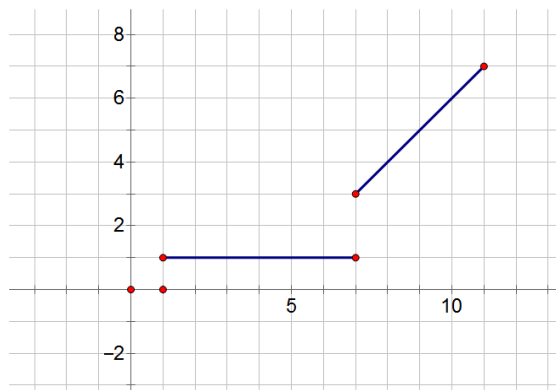


Definition:

Perpendicular Bisector -

example

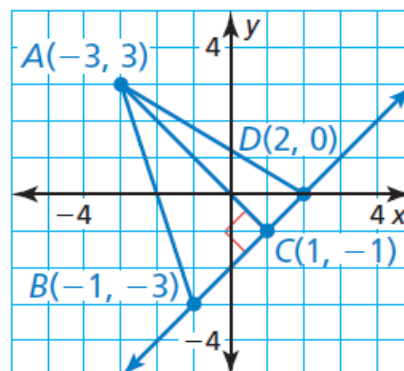
Draw the perpendicular bisectors of each segment in the graph.



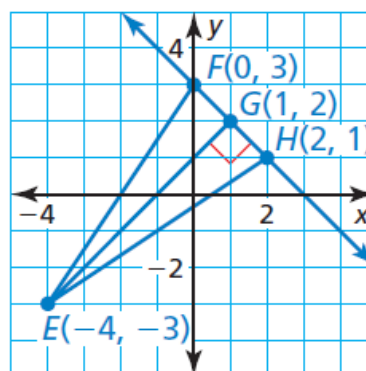
3-4-Notes-Perpendicular-Lines.notebook

Def. : The distance from a point to a line is measured along the perpendicular line that contains the point.

Find the distance from point A to \overleftrightarrow{BD} .



1. Find the distance from point E to \overleftrightarrow{FH} .



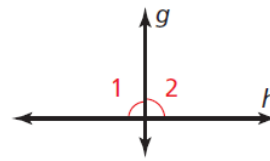
Theorems

Theorem 3.10 Linear Pair Perpendicular Theorem

If two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular.

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

Proof Ex. 13, p. 153

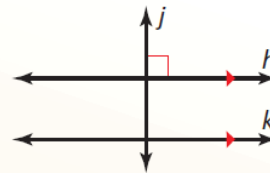


Theorem 3.11 Perpendicular Transversal Theorem

In a plane, if a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other line.

If $h \parallel k$ and $j \perp h$, then $j \perp k$.

Proof Example 2, p. 150; Question 2, p. 150

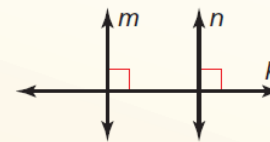


Theorem 3.12 Lines Perpendicular to a Transversal Theorem

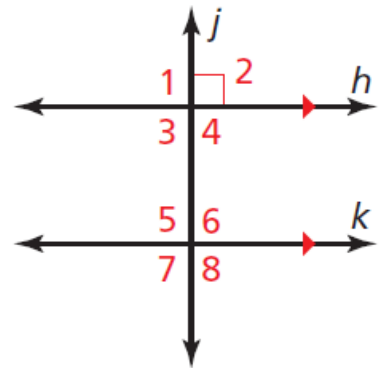
In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.

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

Proof Ex. 14, p. 153; Ex. 47, p. 162



Use the diagram to prove the Perpendicular Transversal Theorem.



3-4-Notes-Perpendicular-Lines.notebook

The photo shows the layout of a neighborhood. Determine which lines, if any, must be parallel in the diagram. Explain your reasoning.

