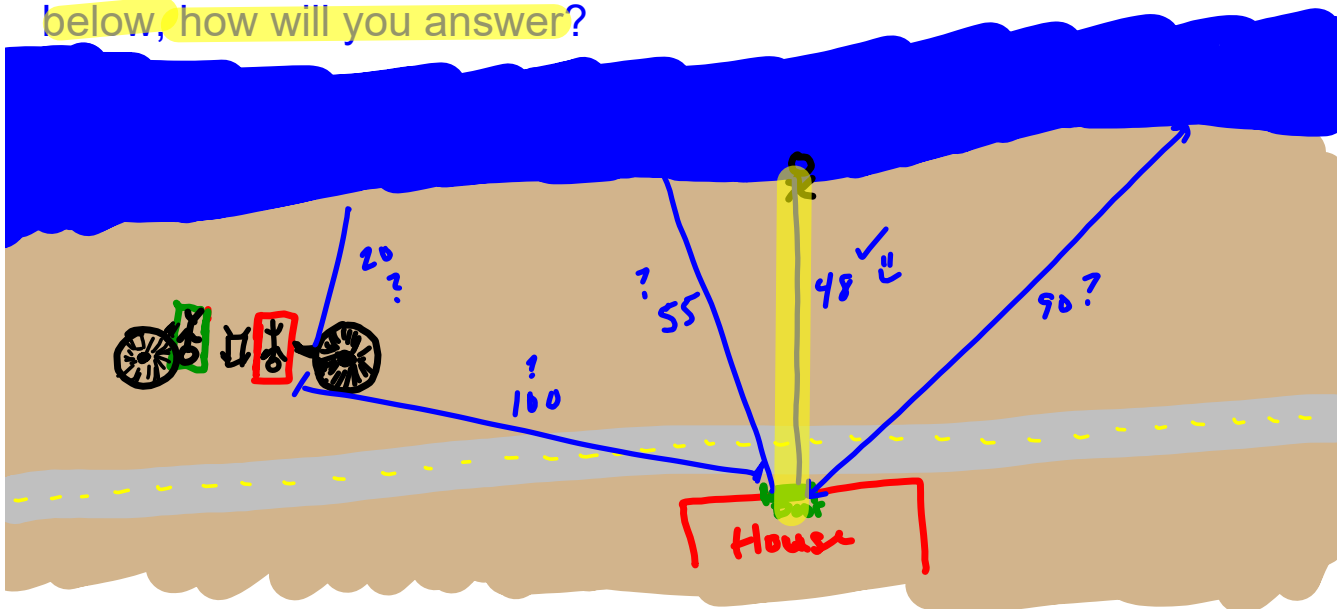


Geometry: 3.4 Proofs with Perpendicular Lines

Warm-up: You are staying at a beach house and a friend calls to ask how far away you are from the ocean. Given the diagram below, how will you answer?

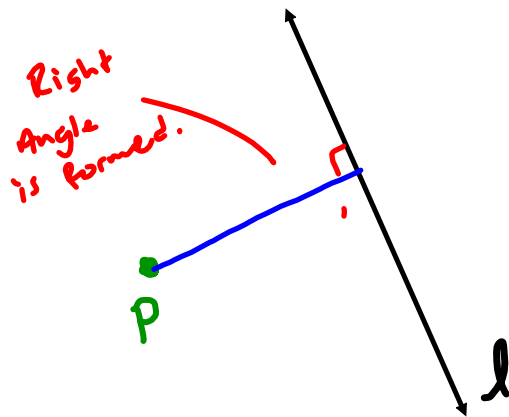


You wouldn't measure from your door to the ocean way far away! You'd measure the shortest distance!

Lesson 3.4 Proofs with Perpendicular Line

The distance to something is always calculated as the Shortest distance to it.

Ex: Draw the shortest path from the point to the line.



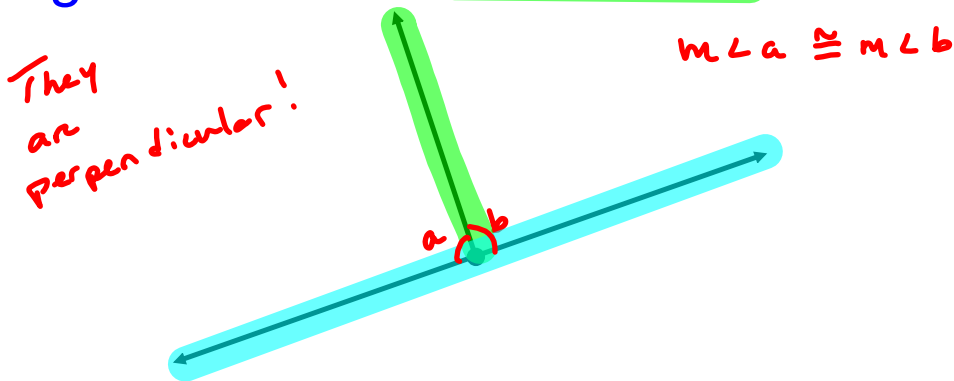
The shortest distance from a point to a line forms a RIGHT ANGLE.

Lesson 3.4 Proofs with Perpendicular Line

Deriving a theorem:

Setup: Draw a linear pair with congruent angle measures.

Question: What can we conclude about the straight line vs the shared side?

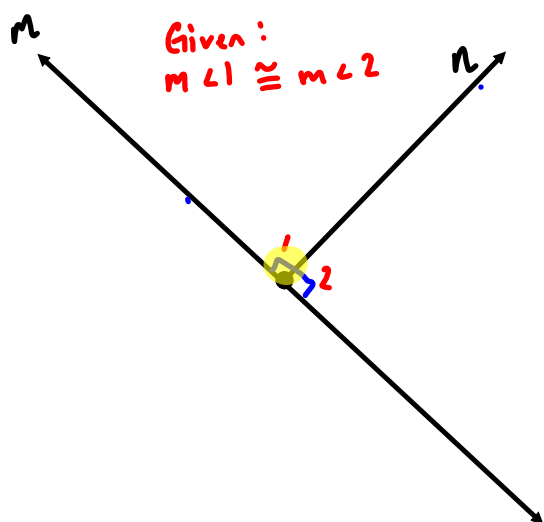


Theorem 3.10 - Linear Pair Perpendicular Theorem

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

Lesson 3.4 Proofs with Perpendicular Line

Ex: Based on the evidence, what can we conclude about the lines N and M? Explain.

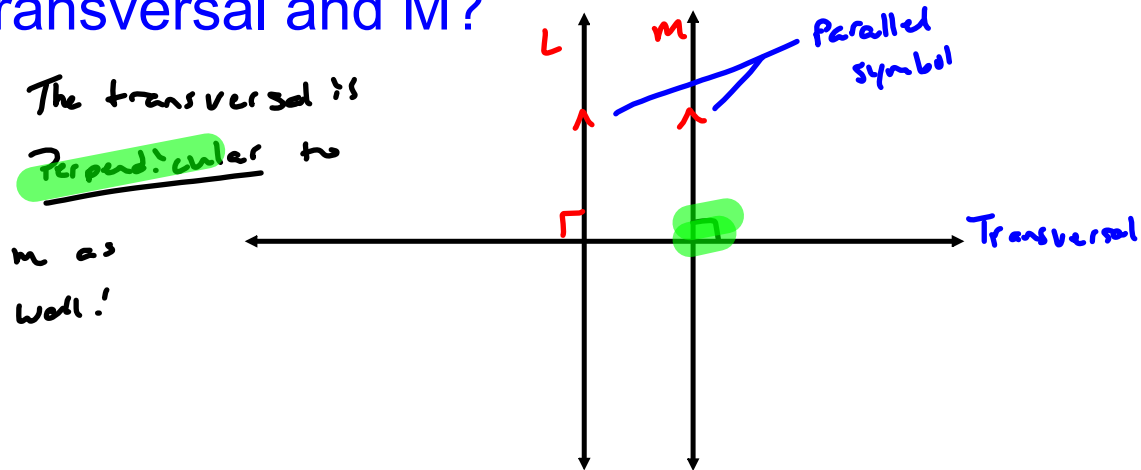


They are perpendicular.
because a right angle
forms from the lines
crossing / touching

Deriving:

Setup: Draw a pair of parallel lines. Label the lines L and M. Then draw a perpendicular transversal to the line L.

Question: What is the relationship between the transversal and M?



Theorem 3.11 - Perpendicular Transversal Theorem

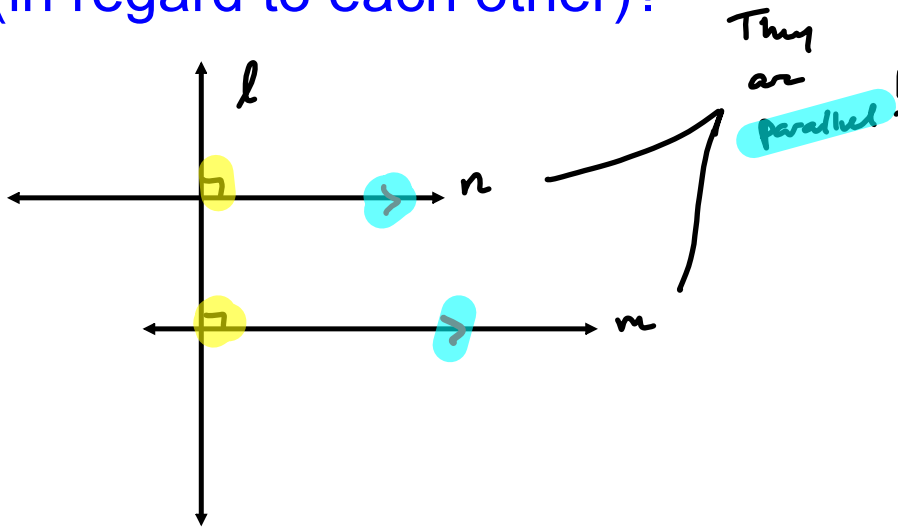
If a transversal is perpendicular to one of two parallel lines, it is perpendicular to the other parallel line.

Lesson 3.4 Proofs with Perpendicular Line

Deriving:

Setup: Draw a line labeled l . Draw two lines perpendicular to l labeled n and m .

Question: What can we conclude about n and m (in regard to each other)?

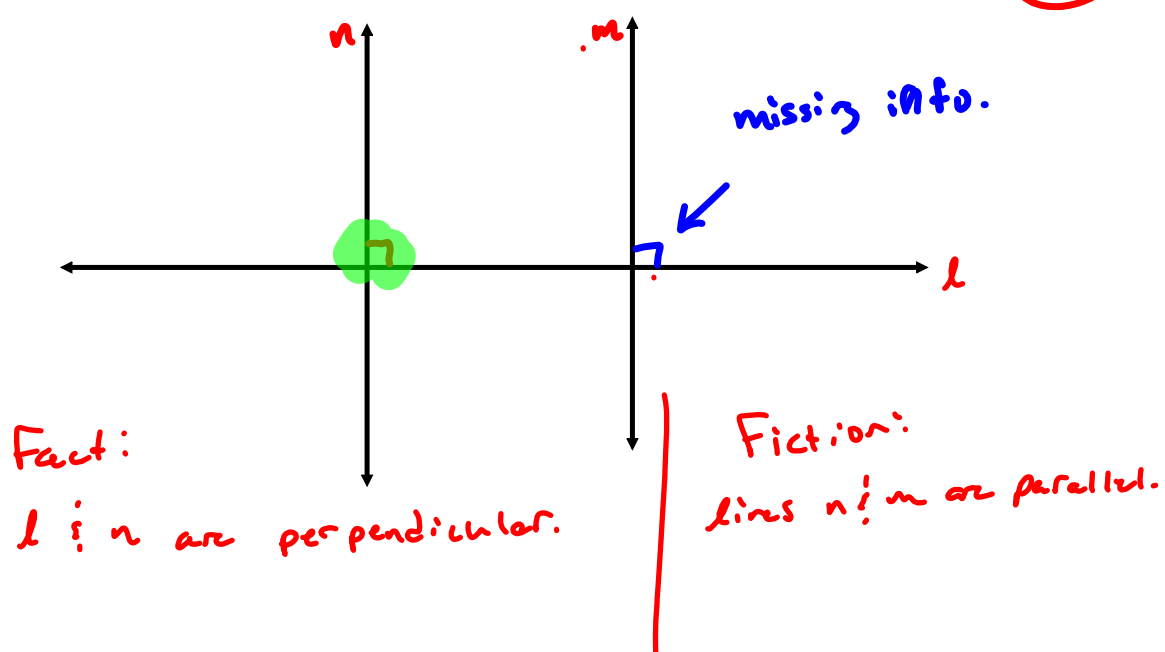


Theorem 3.12 - Lines Perpendicular to a Transversal Theorem.

If two lines are perpendicular to the same line, then they are parallel to each other.

Lesson 3.4 Proofs with Perpendicular Line

Ex: Based on the evidence, can we conclude the lines N and M are parallel? Explain. **NO**



Homework:

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Numbers 11, 12, 23, 25.

You must provide justification for 23, for each angle. Your justification doesn't need to be long. ("Vertical Angles w/ _____", "Complimentary to _____", etc)