

NO QUIZ TODAY!!

**We're starting chapter 7 and skipping
chapters 5 & 6!!**

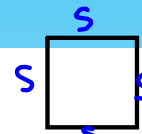
Grab a SM2 book from the front of the room
and start tearing out chapter 7, pgs.478-563

Squares and Rectangles

Properties of Squares and Rectangles

7.1

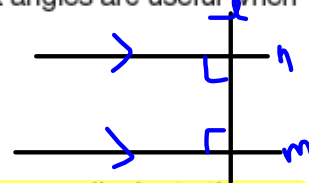
PG.479-480 IN YOUR BOOK



A quadrilateral is a four-sided polygon. A square is a quadrilateral with four right angles and all sides congruent.

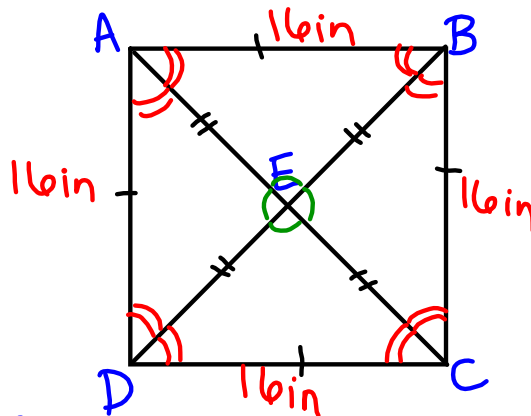
Quadrilaterals have different properties that are directly related to the measures of their interior angles and their side lengths. Perpendicular lines and right angles are useful when proving properties of certain quadrilaterals.

PG.481 IN YOUR BOOK



The **Perpendicular/Parallel Line Theorem** states: "If two lines are perpendicular to the same line, then the two lines are parallel to each other."

2. Draw a square with two diagonals. Label the vertices and the intersection of the diagonals. List all of the properties you know to be true.



A diagonal of a polygon is a line segment that connects two non-adjacent vertices.



$$AB \cong BC \cong CD \cong AD$$

$$AE \cong EC \cong DE \cong EB \quad \& \text{diagonals bisect one another}$$

$$AC \cong BD \text{ (diagonals)}$$

$$\angle AEB \cong \angle BEC \cong \angle CED \cong \angle DEA$$

$$\triangle AEB \cong \triangle BEC \cong \triangle CED \cong \triangle DEA$$

The diagonals bisect the 90° angles of the square.

The diagonals intersect each other at 90° angles.
($\angle AEB, \angle BEC, \angle CED, \angle DEA$)

$$AB \parallel CD \quad \& \quad BC \parallel AD$$

10 mins on pg. 482 - 485

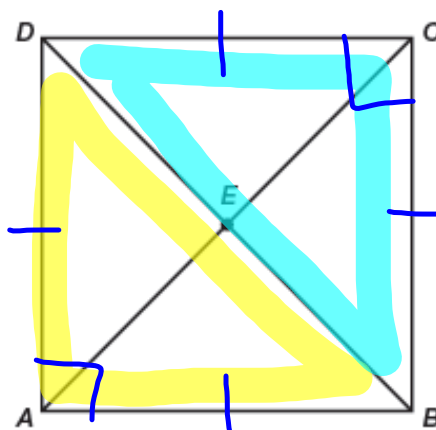
PG.482 IN YOUR BOOK

4. Prove the statement $\triangle DAB \cong \triangle CBA$.

Given: Square $ABCD$ with diagonals \overline{AC} and \overline{BD} intersecting at point E

Prove: $\triangle DAB \cong \triangle CBA$

SAS \cong



5. Do you have enough information to conclude $\overline{AC} \cong \overline{BD}$?
Explain your reasoning.

yes

You have just proven a property of a square: that its diagonals are congruent. You can now use this property as a valid reason in future proofs.



Properties of Squares

(PG.482,483,484, and 485 IN YOUR BOOK)

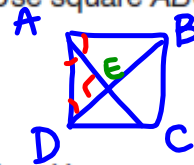
The image shows three students, a boy on the left and two girls in the middle and right. Each student has a speech bubble above them containing text about square properties. Blue arrows point from the title 'Properties of Squares' to each of the three speech bubbles.

Boy's speech bubble: You have just proven a property of a square: that its diagonals are congruent. You can now use this property as a valid reason in future proofs.

Girl in the middle's speech bubble: You have just proven another property of a square: that its opposite sides are parallel. You can now use this property as a valid reason in future proofs.

Girl on the right's speech bubble: You have just proven another property of a square: that its diagonals bisect each other. You can now use this property as a valid reason in future proofs.

10. Prove that the diagonals of a square bisect the vertex angles. Use square $ABCD$ in Question 8.



11. Prove that the diagonals of a square are perpendicular to each other. Use square $ABCD$ in Question 8.

PG.486 IN YOUR BOOK

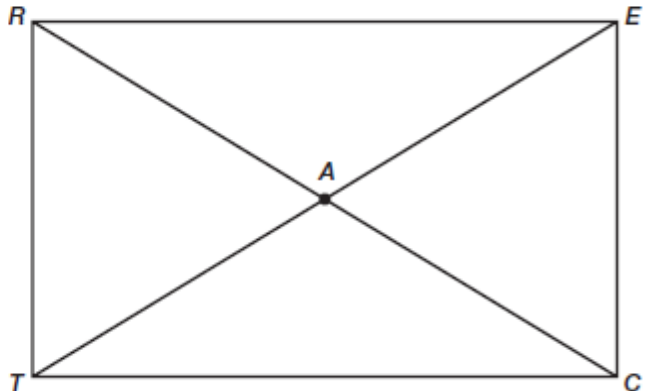
A rectangle is a quadrilateral with opposite sides congruent and all angles congruent.

1. Draw a rectangle with two diagonals. Label the vertices and the intersection of the two diagonals. List all of the properties you know to be true.

- $AB \cong DC$
- $AD \cong BC$
- $\angle ADC \cong \angle CBA \cong \angle BAD \cong \angle BCD$
(all \angle s are 90°)
- $AC \cong BD$ (diagonals are \cong)
- $AE \cong EC \cong DE \cong EB$
- $AB \parallel DC$ and $AD \parallel BC$
- $\triangle AEB \cong \triangle DEC$ (SSS or SAS \cong)
- $\triangle AED \cong \triangle BEC$ (SSS or SAS \cong)

3. Prove the statement $\triangle RCT \cong \triangle ETC$.

Given: Rectangle $RECT$ with diagonals \overline{RC} and \overline{ET} intersecting at point A
 Prove: $\triangle RCT \cong \triangle ETC$



Properties of Rectangles
PG.488 IN YOUR BOOK

5. Describe how you could prove the second pair of opposite sides of the rectangle are congruent.

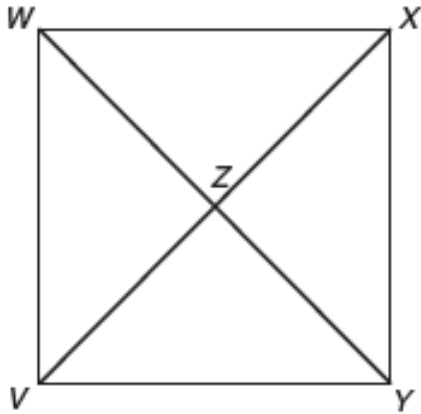
6. Do you have enough information to conclude rectangle *RECT* is a parallelogram? Explain your reasoning.

7. Do you have enough information to conclude the diagonals of a rectangle are congruent? Explain your reasoning.

8. Do you have enough information to conclude the diagonals of a rectangle bisect each other? Explain your reasoning.

NOT IN YOUR BOOK

1. In quadrilateral $VWXY$, segments VX and WY bisect each other, and are perpendicular and congruent. Is this enough information to conclude that quadrilateral $VWXY$ is a square? Explain.



NOT IN YOUR BOOK

Quadrilateral $PQRS$ is a rectangle with diagonals PR and QS .

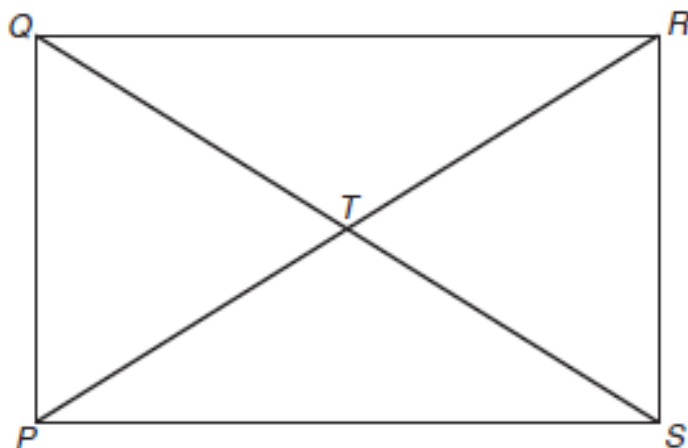
2. Name all parallel segments.

3. Name all congruent segments.

4. Name all right angles.

5. Name all congruent angles.

6. Name all congruent triangles.



Homework

Finish 7.1