

Technology Activity

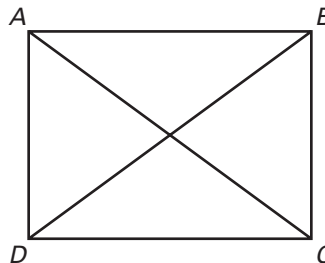
For use with pages 347–355

GOAL To use geometry software to verify statements about special parallelograms

Geometry software can be used to verify statements about special parallelograms. For example, you could use geometry software to construct the rectangle below. Then, you could use the software's tools to verify the statement about diagonals of the rectangle.

Given: $ABCD$ is a rectangle.

Prove: $\overline{AC} \cong \overline{BD}$

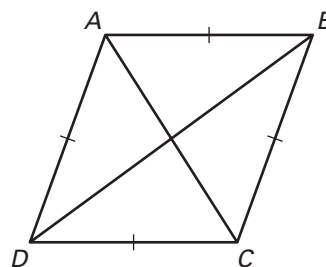
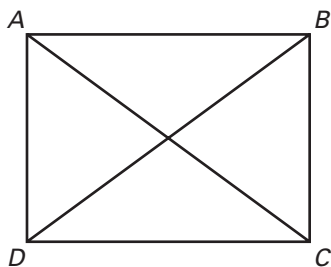
**Activity**

- 1 Construct rectangle $ABCD$ (see figure above.) Use the software's grid feature to ensure that you construct the sides such that the opposite sides are parallel and congruent.
- 2 Construct the diagonals of the rectangle, \overline{AC} and \overline{BD} .
- 3 Measure the lengths of \overline{AC} and \overline{BD} and verify that $\overline{AC} \cong \overline{BD}$.

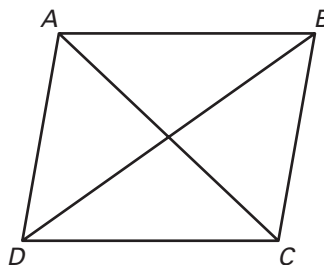
Exercises

Use geometry software to verify the following.

1. **Given:** $ABCD$ is a parallelogram, $\overline{AC} \cong \overline{BD}$.
Prove: $ABCD$ is a rectangle.
2. **Given:** $ABCD$ is a rhombus.
Prove: $\overline{AC} \perp \overline{BD}$



3. **Given:** $ABCD$ is a rhombus.
Prove: \overline{AC} bisects $\angle DAB$ and $\angle BCD$
and \overline{BD} bisects $\angle ADC$ and $\angle ABC$.



Technology Activity Keystrokes

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TI-92

1. Construct rectangle $ABCD$.

F8 9 (Set Coordinate Axes to RECTANGULAR and Grid to ON.) **ENTER**

F3 4 (Move cursor to point $(-2, 1)$ and prompt says, “ON THIS POINT OF THE GRID.”) **ENTER** A (Move cursor to point $(2, 1)$ and prompt says,

“ON THIS POINT OF THE GRID.”) **ENTER** B (Move cursor to point $(2, -1)$

and prompt says, “ON THIS POINT OF THE GRID.”) **ENTER** C (Move

cursor to point $(-2, -1)$ and prompt says, “ON THIS POINT OF THE GRID.”)

ENTER D (Move cursor to point A.) **ENTER**

2. Construct the diagonals of the rectangle, \overline{AC} and \overline{BD} .

F2 5 (Move cursor to point A.) **ENTER** (Move cursor to point C.) **ENTER**

(Move cursor to point B.) **ENTER** (Move cursor to point D.) **ENTER**

3. Measure the lengths of \overline{AC} and \overline{BD} .

F6 1 (Move cursor to \overline{AC} .) **ENTER** (Move cursor to \overline{BD} .) **ENTER**

Technology Activity Keystrokes

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SKETCHPAD

1. Turn on the axes and the grid. Choose **Snap To Grid** from the **Graph** menu.

Choose the segment straightedge tool.

Draw a segment from $(-2, 1)$ to $(2, 1)$.

Draw a segment from $(2, 1)$ to $(2, -1)$.

Draw a segment from $(2, -1)$ to $(-2, -1)$.

Draw a segment from $(-2, -1)$ to $(-2, 1)$. Label the points.

Choose the text tool. Label point $(-2, 1)$ *A*, label point $(2, 1)$ *B*, label point $(2, -1)$ *C*, and label point $(-2, -1)$ *D*.

Turn off the axes and the grid.

Choose **Hide Axes** from the **Graph** menu.

Choose **Hide Grid** from the **Graph** menu.

2. Choose the segment straightedge tool and construct the diagonals of the rectangle, \overline{AC} and \overline{BD} .

3. Measure the lengths of \overline{AC} and \overline{BD} .

Choose the selection arrow tool and select \overline{AC} . Then hold down the shift key, select \overline{BD} , and choose **Length** from the **Measure** menu.