Properties of Two-Dimensional Figures

Properties of Two-Dimensional Figures: Models and Computation

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QUICK REVIEW

Matching arrow marks show parallel side pairs. If extended, parallel sides never meet. Perpendicular sides meet at $90°$. Every right angle in a pictured polygon is marked with a small square.

Worked example

Two horizontal bars are 2 cm apart. A vertical bar joins them. How are the two horizontal bars related? How does the connector meet them?

1. The horizontal bars stay 2 cm apart along their entire length and would not meet if extended.

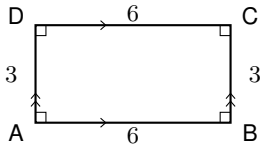
2. Where a vertical bar meets a horizontal one it forms $90°$, so the connector is perpendicular to both.

Answer: The horizontal bars are parallel. The connector meets each at a right angle.

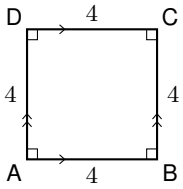
Practice Problems

Show your thinking.

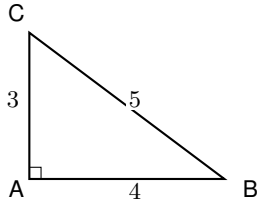
1. Name both pairs of parallel sides in $ABCD$. Name one pair of perpendicular sides.



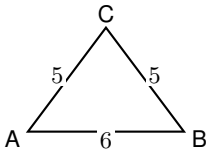
2. Which sides of $ABCD$ have the same marked length? Give their names and the length.



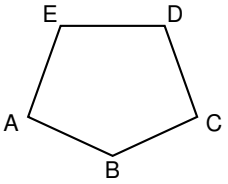
3. Count the sides, vertices, and right angles of ABC. Name the vertex of any right angle.



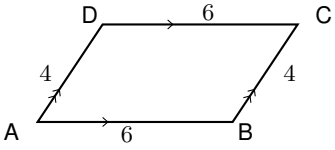
4. Name the pair of equal-length sides in ABC. How much longer is the remaining side?



5. Trace the boundary of $ABCDE$. How many straight sides, vertices, and right angles does it have?



6. A student counts one right angle in $ABCD$. Correct the count and explain using the directions of the sides.



Answer Key

1. $AB \parallel CD$, $BC \parallel AD$; for example, $AB \perp AD$.
2. All four: AB, BC, CD, DA each have length 4 units.
3. 3 sides, 3 vertices, and 1 right angle at A.
4. $AC = BC = 5$ units; AB is 1 unit longer.
5. 5 sides, 5 vertices, 0 right angles.
6. 0 right angles.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. AB and CD each have 1 arrow. BC and AD each have 2 arrows. Each match names a parallel pair.

2. The square mark at A shows 90° between AB and AD, so those sides are perpendicular.

Problem 2

1. The labels on AB and BC both read 4.

2. CD and DA are also labeled 4, so all 4 sides belong to one equal-length group.

Problem 3

1. Trace AB, BC, CA: 3 straight sides meet at the 3 vertices A, B, C.

2. Only A has a square-corner mark, so the triangle has 1 right angle.

Problem 4

1. Both AC and BC carry the length 5.

2. AB is labeled 6, so it is $6 - 5 = 1$ unit longer than either.

Problem 5

1. AB, BC, CD, DE, EA are 5 straight sides. They meet at 5 distinct corners.

2. None of the corners has a square mark. With every right angle marked, the count is 0.

Problem 6

1. AB and CD are horizontal. A side would have to be vertical to make a 90° corner with either.

2. AD and BC slant instead of running vertically. Each corner joins a horizontal side to a slanted side, so 0 corners are right.

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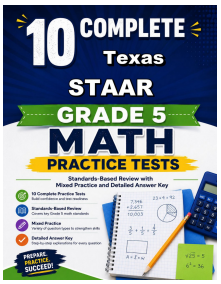

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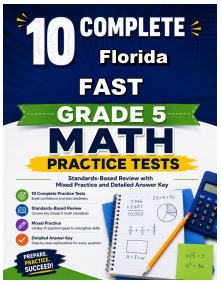

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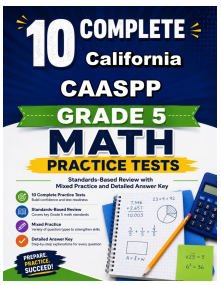

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