Classifying Triangles and Quadrilaterals

Classifying Triangles and Quadrilaterals: Models and Computation

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

One figure can belong to several groups. Rectangles have 4 right angles; rhombuses have 4 equal sides. A square meets both definitions. For triangles, classify sides and angles separately. Isosceles means at least 2 equal sides.

Worked example

A triangle has sides $4, 4, 5$ and all angles less than $90°$. Classify it by sides and angles.

1. The two sides of length 4 are equal, while $5 \neq 4$. It is isosceles, not equilateral.

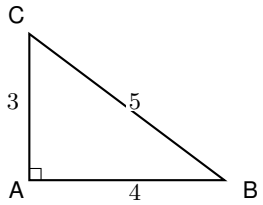
2. All 3 angles are below $90°$. That meets the definition of an acute triangle.

Answer: Isosceles and acute.

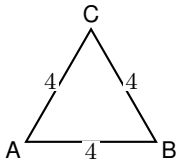
Practice Problems

Show your thinking.

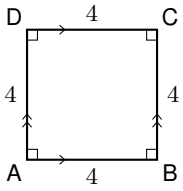
1. Which tags belong on ABC: triangle, right triangle, scalene triangle, or isosceles triangle? Give evidence from the marks.



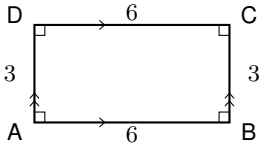
2. A triangle has sides $4, 4, 4$ and three $60°$ angles. Give its most specific side group and its angle group. Does it also belong to the isosceles group?



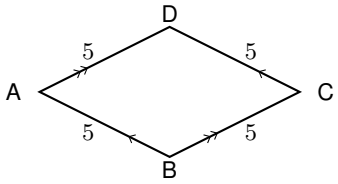
3. List all names that fit the marked square: quadrilateral, parallelogram, rectangle, rhombus, square.



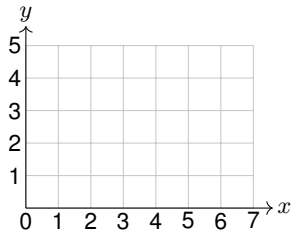
4. Can a 6 cm by 3 cm rectangle also be a square? Identify the property that decides.



5. A student says every rhombus is a square. Use the pictured rhombus to test that claim. The drawing marks all right angles, if any.



6. Draw a rectangle on the grid that is not a square. Label its vertices A, B, C, D in order. Give the ordered pairs and name both pairs of parallel sides.



Answer Key

1. Triangle, right triangle, and scalene triangle.
2. Equilateral and acute. It is also isosceles.
3. All five: quadrilateral, parallelogram, rectangle, rhombus, square.
4. No. Its adjacent side lengths differ.
5. False. This rhombus has equal sides but no right angles.
6. Example: $A(1,1), B(6,1), C(6,3), D(1,3)$. $AB \parallel CD$ and $BC \parallel AD$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. There are 3 sides, and $3 < 4 < 5$ shows that their lengths are all different. It is scalene, not isosceles.

2. The square corner at A is 90°, so it also belongs to the right-triangle group.

Problem 2

1. All 3 sides are equal, so it is equilateral. Since $3 \geq 2$, it meets the at-least-two requirement for isosceles as well.

2. Each angle is 60°, and $60 < 90$, so all three angles are acute.

Problem 3

1. The 4 sides make it a quadrilateral. The 2 pairs $AB \parallel CD$ and $BC \parallel AD$ make it a parallelogram.

2. Its 4 right angles make it a rectangle. Its 4 equal sides make it a rhombus. Together they make it a square.

Problem 4

1. The rectangle has 4 right angles. That meets one condition for a square.

2. A square also needs 4 equal sides. Here $6 - 3 = 3$ cm, so the adjacent sides are not equal.

Problem 5

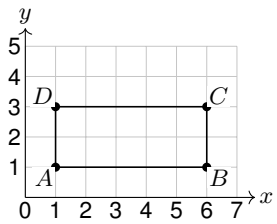
1. Each of the 4 sides is labeled 5. This meets the rhombus condition.

2. None of the 4 corners has a right-angle mark, so this figure does not have the 4 right angles a square needs.

Problem 6

1. Use rows $y = 1$ and $y = 3$ for AB and CD, so $AB \parallel CD$. Use columns $x = 6$ and $x = 1$ for BC and AD, so $BC \parallel AD$.

2. The horizontal and vertical sides meet at 4 right angles. The side lengths $6 - 1 = 5$ and $3 - 1 = 2$ units differ, so the rectangle is not a square.



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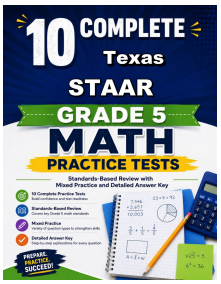

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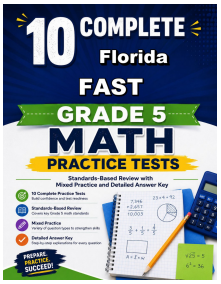

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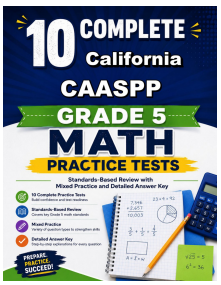

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