Rectangle Properties Quiz

Grade Level: Grade 9 | **Date:** 2025-11-16 18:52:08

Instructions: Answer all questions. Show your work where applicable.

Question 1: What is the fundamental definition of a rectangle?

A) A quadrilateral with all sides equal.
B) A parallelogram with all angles equal to 90 degrees.
C) A quadrilateral with opposite sides parallel and equal.
D) A parallelogram whose diagonals are perpendicular.

Question 2: If one angle of a rectangle is 90 degrees, what is the measure of each of its other angles?

A) 60 degrees
B) 90 degrees
C) 120 degrees
D) It depends on the side lengths.

Question 3: In rectangle ABCD, if the length of diagonal AC is 15 cm, what is the length of diagonal BD?

A) 7.5 cm
B) 15 cm
C) 20 cm
D) 30 cm

Question 4: Explain why the diagonals of a rectangle bisect each other.

Answer: _____

Question 5: Which of the following statements is always true for a rectangle?

A) All sides are equal.
B) Diagonals are perpendicular.
C) Opposite angles are equal.
D) Diagonals bisect the angles.

Question 6: If a parallelogram is also a cyclic quadrilateral (meaning all its vertices lie on a circle), what specific type of quadrilateral must it be?

Answer: _____

Question 7: ABCD is a rectangle. If P, Q, R, and S are the mid-points of the sides AB, BC, CD, and DA respectively, what type of quadrilateral is PQRS?

A) Parallelogram
B) Rectangle
C) Rhombus
D) Square

Question 8: In rectangle ABCD, diagonal AC is drawn. If $\angle BAC = 40°$, find the measure of $\angle ACD$.

Answer: _____

Question 9: A parallelogram has diagonals that are equal in length. What specific type of parallelogram is it?

A) Rhombus
B) Square
C) Rectangle
D) Trapezium

Question 10: If the diagonals of a cyclic quadrilateral are diameters of the circle passing through its vertices, what can you conclude about this quadrilateral?

Answer: _____

Answer Key

Question 1: B

Explanation: A rectangle is defined as a parallelogram in which one angle is a right angle. This implies all angles are 90 degrees.

Question 2: B

Explanation: As shown in the text, if one angle of a rectangle is 90 degrees, then all its angles must be 90 degrees.

Question 3: B

Explanation: One of the key properties of a rectangle is that its diagonals are equal in length.

Question 4: The diagonals of a rectangle bisect each other because a rectangle is a special type of parallelogram, and a fundamental property of all parallelograms is that their diagonals bisect each other.

Explanation: A rectangle is a parallelogram, and a property of parallelograms is that their diagonals bisect each other. This property holds true for rectangles as well.

Question 5: C

Explanation: A rectangle is a parallelogram, and opposite angles of a parallelogram are always equal. Since all angles in a rectangle are 90 degrees, opposite angles are indeed equal. Options A, B, and D are only true for specific types of rectangles (squares or rhombuses).

Question 6: A rectangle.

Explanation: The text states that 'a cyclic parallelogram is a rectangle'. This is a known theorem in geometry.

Question 7: C

Explanation: The text explicitly mentions that if P, Q, R, S are mid-points of the sides of a rectangle, then PQRS is a rhombus.

Question 8: 40°

Explanation: In a rectangle, opposite sides are parallel (AB || DC). When a transversal AC intersects these parallel lines, alternate interior angles are equal. Therefore, $\angle BAC = \angle ACD$.

Question 9: C

Explanation: A key property used to define a rectangle from a parallelogram is that if the diagonals of a parallelogram are equal, then it is a rectangle.

Question 10: It is a rectangle.

Explanation: The text states that if the diagonals of a cyclic quadrilateral are diameters of the circle through its vertices, then it is a rectangle.