Exploring Diagonals of Rectangles and Squares

A. Choose the Correct Answer:

1. How many diagonals does a square have?

a) 1	b) 2
c) 3	d) 4

2. Diagonals of a rectangle are:

- a) Equal in length
- c) Curved d) Parallel
- b) Unequal in length

3. Diagonals of a square:

- a) Are equal and intersect at 60°
- b) Are unequal
- c) Are equal and perpendicular to each other
- d) Never meet

4. Which of the following statements is true?

- a) Diagonals of a rectangle are perpendicular
- b) Diagonals of a square bisect each other at 90°
- c) Diagonals of a square are unequal
- d) Diagonals of a rectangle are not equal

5. What do the diagonals of a rectangle do at the point where they meet?

- a) Cross at 45° b) Divide each other unequally
- c) Divide each other equally d) Form an obtuse angle

B. Write the Missing Terms to Complete the Sentences:

- 1. A square has <u>diagonals</u>.
- 2. Diagonals of a square are _____ in length.
- 3. In a rectangle, the diagonals _____ each other.
- 4. The point where the diagonals of a square meet is the _____ of the square.
- 5. In a square, the diagonals intersect at _____ angles.

C. Figure out the answers to these questions:

- 1. Draw a square of side 5 cm and draw both of its diagonals. Mark the point of intersection.
- 2. Construct a rectangle with length 6 cm and breadth 4 cm. Draw both diagonals and label all vertices.

- 3. Compare the diagonals of a rectangle and a square by drawing both and writing their properties.
- 4. Without measuring, guess which shape has perpendicular diagonals: rectangle or square. Then verify by construction.
- 5. Draw a rectangle. Measure the length of both diagonals and record your observation.
- 6. Draw a square and fold it along both diagonals. What do you observe about the folds and symmetry?
- 7. Use a compass and ruler to construct a square. Show that its diagonals bisect each other at right angles.
- 8. Create two rectangles with different dimensions and draw their diagonals. Check if the diagonals are equal in each.

D. Mark each sentence with a True (\checkmark) or False (X):

- 1. A rectangle has two diagonals that are always equal.
- 2. Diagonals of a square intersect at right angles.
- 3. In both square and rectangle, diagonals are perpendicular to each other.
- 4. A square has more diagonals than a rectangle.
- 5. The diagonals of a square divide it into four right-angled triangles.

E. Challenge yourself with these questions:

- 1. Draw a square and show how the diagonals create symmetry in the figure.
- 2. Construct a rectangle and shade the two triangles formed by one diagonal.
- 3. Can you construct a square using only its diagonals as a guide? Try and describe your method.
- 4. Create a square and measure the length of its diagonals. Compare it with the side length.
- 5. Draw a rectangle and use its diagonals to check whether the opposite angles are equal.
- 6. Construct two squares of different sizes and draw their diagonals. What similarities do you observe?