Properties of a Parallelogram

A. Choose the Correct Answer:

1. In a parallelogram, opposite sides are:

- a) Perpendicular
- b) Unequal
- c) Equal and parallel
- d) Equal but not parallel

2. The diagonals of a parallelogram:

- a) Are equal and perpendicular
- b) Do not bisect each other
- c) Bisect each other
- d) Are always unequal

3. Which of the following is always true for a parallelogram?

- a) All angles are 90°
- b) All sides are equal
- c) Diagonals are equal
- d) Opposite angles are equal

B. Write the Missing Terms to Complete the Sentences:

- 1. In a parallelogram, opposite angles are _____.
- 2. Adjacent angles in a parallelogram are _____.
- 3. The diagonals of a parallelogram _____ each other.
- 4. A parallelogram with all sides equal and all angles 90° is called a ______.
- 5. The sum of any two adjacent angles in a parallelogram is _____ degrees.

C. Figure out the answers to these questions:

- 1. Draw a parallelogram and label its sides, angles, and diagonals. Show which angles are equal and how the diagonals bisect each other.
- 2. In parallelogram ABCD, $\angle A = 70^{\circ}$. Find all other angles of the parallelogram.
- 3. A parallelogram has sides of length 8 cm and 5 cm. Find its perimeter.
- 4. Prove that the diagonals of a parallelogram bisect each other using a diagram and proper reasoning.

5. In a parallelogram, if one diagonal is 10 cm and one half of the other diagonal is 6 cm, find the total length of the second diagonal.

D. Mark each sentence with a True (✔) or False (★):

- 1. In a parallelogram, adjacent sides are always equal.
- 2. Opposite angles of a parallelogram are equal.
- 3. Diagonals of a parallelogram always intersect at 90°.
- 4. The opposite sides of a parallelogram are equal and parallel.
- 5. The sum of all angles in a parallelogram is 360°.

E. Challenge yourself with these questions:

- 1. List any four daily life objects that are shaped like a parallelogram.
- 2. Compare and contrast a rectangle and a parallelogram based on diagonals, angles, and sides.
- 3. Explain with reasoning whether a rhombus is always a parallelogram.
- 4. Construct a parallelogram using ruler and protractor with given side lengths and angle, and verify its properties.
- 5. A parallelogram has one angle of 110°. Find all other angles and explain your method clearly.