CHAPTER 8

PLAYING WITH CONSTRUCTIONS

Complete Notes with Step-by-Step Constructions

Tools Required: Ruler | Compass | Protractor | Pencil

Table of Contents

8.1 Artwork – Circles & Compass

What is a Curve?

A curve is any shape that can be drawn on paper without lifting the pencil. This includes straight lines, circles, wavy lines, irregular shapes — everything!

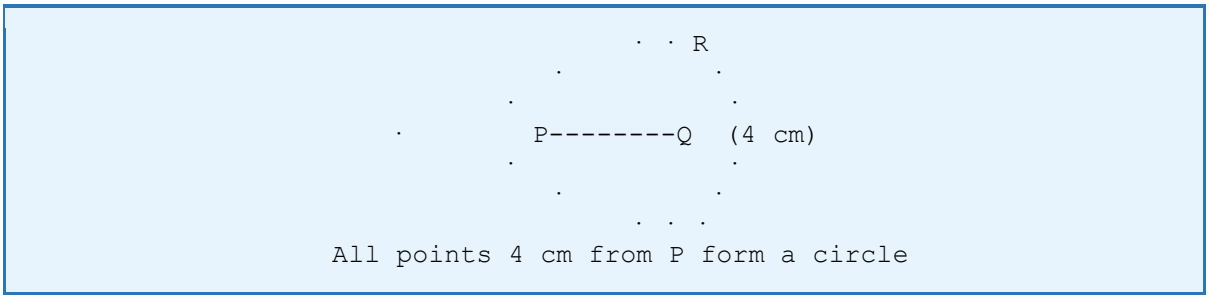
> Straight lines, circles, zigzag lines, wavy lines — all are CURVES in mathematics!

Introducing the Circle

Activity: Mark a point P on your notebook. Now mark as many points as possible that are exactly 4 cm away from P in all directions.

> Think: What shape will all those points (each 4 cm from P) form when joined together?

Answer: They will form a CIRCLE with centre P and radius 4 cm!



> **Circle: Centre = P, Radius = distance from centre to any point on circle**

Note: Centre is the fixed point. Radius is the equal distance from centre to any boundary point.

How to Use a Compass

A compass has two arms: (1) a sharp metal tip (fixed end) and (2) a pencil (drawing end).

Step	Action
Step 1	Open the compass against a ruler to the desired radius (e.g., 4 cm).
Step 2	Place the sharp tip firmly at the centre point P.
Step 3	Keep the tip fixed and rotate the pencil arm in a full circle.
Step 4	The curve drawn is a circle of radius = the set distance.

CONSTRUCT: A Person (Page 190)

The figure 'A Person' has two parts: (1) A circle for the head (2) A rectangular body with curved shoulder cuts.

Q: How do you construct 'A Person' figure using a ruler and compass?

Given: Figure with: a circle (head) and a square/rectangle body with curved top cuts.

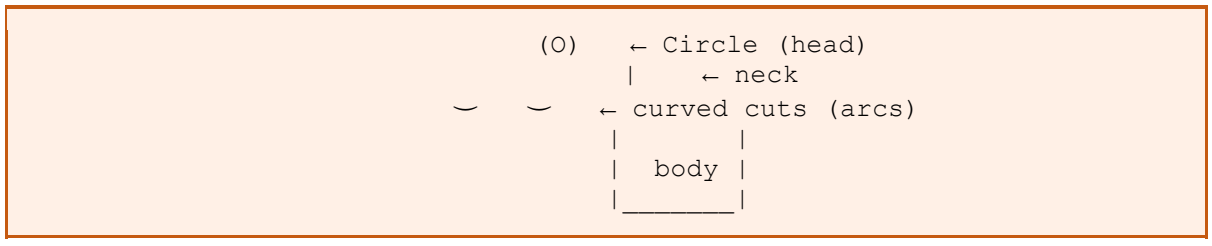
To Construct: Recreate the figure using compass.

Step 1: Draw the body — a rectangle using ruler. Mark it ABCD.

Step 2: For the neck curves (at top of body), fix a small radius in compass (about 1 cm). Place tip at a point above A and draw a downward arc. Repeat from the other side.

Step 3: For the head, place compass tip at the top-center of the neck. Set radius to about 1.5 cm. Draw a full circle.

Step 4: The two parts — circle head + rectangular body with neck curves — form 'A Person'.



✦ Result: A Person is constructed using: 1 circle + 1 rectangle + 2 small arcs for neck.

CONSTRUCT: Wavy Wave (Page 191)

A wave pattern made of alternating half-circles (semicircles) above and below a central straight line.

Let AB = 8 cm be the central line. The first wave is a half-circle above AB.

🔢 Figure It Out – Wavy Wave (Page 191)

Q1: What radius should be taken in the compass to get the half circle? What should be the length of AX?

Given: Central line AB = 8 cm. First wave = one semicircle above line.

Step 1: The semicircle spans from A to X. The diameter = AX.

Step 2: For AB = 8 cm with 2 equal waves, each wave = 4 cm wide. So AX = 4 cm.

Step 3: Radius of compass = AX ÷ 2 = 4 ÷ 2 = 2 cm.

Step 4: Place tip at midpoint of AX. Draw upper semicircle. Then place tip at midpoint of XB. Draw lower semicircle.

✦ Result: Radius = 2 cm, AX = 4 cm

Q2: Take a central line of a different length and try to draw the wave on it.

Method: Choose any length, say 12 cm. Divide into equal parts (e.g., 3 cm each). Draw alternating semicircles above and below. Each radius = half of each part.

✦ Result: For a 12 cm line with 4 waves: each part = 3 cm, radius = 1.5 cm.

Q3: Try to recreate the figure where the waves are smaller than a half circle (as in the neck of 'A Person'). Both waves should be identical.

Key: Use a larger radius (more than half the wave width) so the arc is shallower (less than a semicircle).

Step 1: Mark two equal segments on the line.

Step 2: For each arc, place the compass tip ABOVE the line (not on the line). Use the same radius for both arcs.

Step 3: The tip position and radius must be identical for both waves to match.

✦ Result: Place compass tip at the same distance above line for both arcs. Use equal radius.

📐 CONSTRUCT: Eyes (Page 192)

Q: How do you draw eyes using a compass?

Each eye is a lens/leaf shape made of two arcs curving in opposite directions.

Step 1: Draw a horizontal line for the width of the eye (e.g., 4 cm).

Step 2: For the UPPER curve: Place compass tip at a point A above the line. Set a large radius. Draw a downward arc from one end to the other of the eye width.

Step 3: For the LOWER curve: Place compass tip at a point B below the line (same distance below as A is above). Use the same radius. Draw an upward arc.

Step 4: The two arcs meet at both ends forming the eye shape. A and B must be on the perpendicular bisector of the eye width for symmetry.

Step 5: Draw a filled circle in the centre (pupil) using compass.

The upper and lower arcs use the SAME radius, with tip positions symmetrically placed above and below the eye axis.

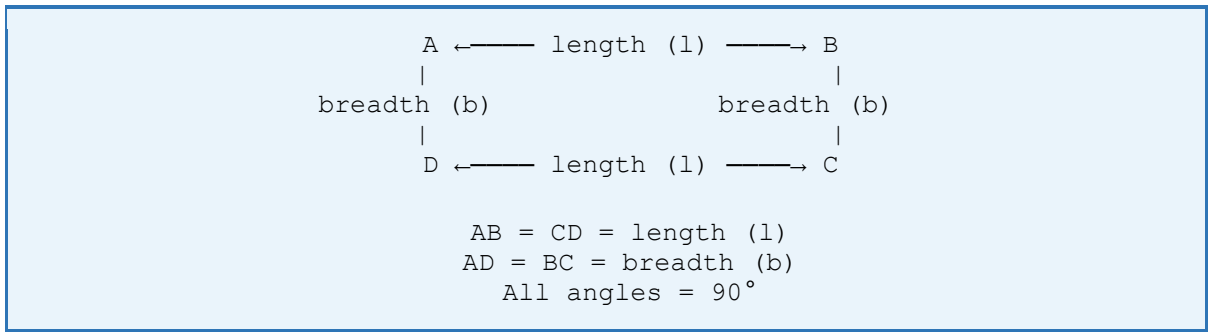
✦ Result: Eye = 2 arcs (one concave, one convex) + filled circle (pupil).

8.2 Squares and Rectangles

Properties of a Rectangle

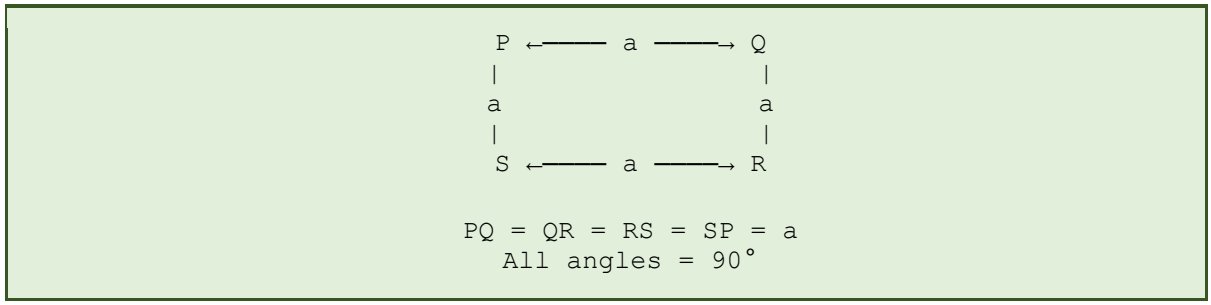
A rectangle ABCD has 4 corners (vertices), 4 sides, and 4 angles.

Rectangle Properties: R1) Opposite sides are equal | R2) All angles = 90°



Properties of a Square

Square Properties: S1) All 4 sides are equal | S2) All angles = 90°



Naming of Rectangles and Squares

A rectangle ABCD can be named by going around its corners in order (clockwise or anti-clockwise). Valid names: ABCD, BCDA, CDAB, DABC, ADCB, DCBA, CBAD, BADC.

INVALID names: ABDC, ACBD (corners not in travel order).

Rule: In a valid name, corners appear in order of travel around the figure, starting from any corner.

Figure It Out – Naming (Page 193)

Q: Which of the following is NOT a name for the square SPQR? 1. PQSR 2. SPQR 3. RSPQ 4. QRSP

Check each:

SPQR → S→P→Q→R → valid (clockwise order) ✓

RSPQ → R→S→P→Q → valid ✓

QRSP → Q→R→S→P → valid ✓

PQSR → P→Q→S→R → INVALID! (skips R, comes back to S — not in travel order)

✦ Result: PQSR is NOT a valid name for the square.

Rotated Squares and Rectangles

If we rotate a square, does it remain a square? Let's check:

- Are all sides still equal? → YES
- Are all angles still 90°? → YES

Therefore, a rotated square is STILL a square! Same logic applies to rectangles.

Rotation does NOT change side lengths or angles. A rotated square is still a square.

Figure It Out – Dot Grid (Page 194)

Q1: Draw the rectangle and four squares configuration on a dot paper.

Method: On dot paper, draw a rectangle in the centre. Then draw one square touching each side of the rectangle, placed symmetrically. Each square should be the same size.

✦ Result: Place each smaller square so its side aligns with one side of the central rectangle.

Q2: Identify if there are any squares in the given collection (A, B, C, D on dot grid).

Answer: Shape A is a square (all sides equal, all angles 90°).

Shapes B, C, D: These are rectangles or rhombus-like shapes (sides not all equal OR angles not 90°).

Think: On a dot grid, you can verify equal sides by counting dot-spaces. Right angles can be checked by seeing if the sides go equally horizontally and vertically.

✦ Result: Shape A is a square. Others are not.

Q3: Draw at least 3 rotated squares and rectangles on a dot grid. Verify properties.

Verification for any square drawn:

Measure all 4 sides — they should be equal.

Check all 4 angles — they should be 90°.

For rectangle: opposite sides equal, all angles 90°.

✦ Result: All rotated squares/rectangles satisfy their properties regardless of rotation angle.

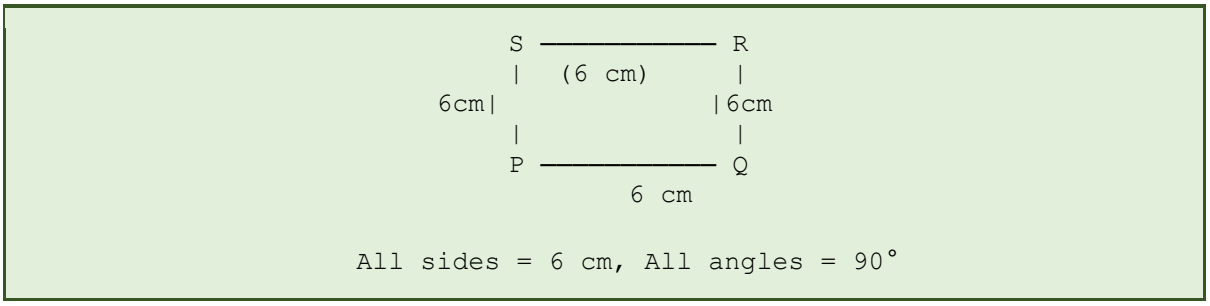
8.3 Constructing Squares and Rectangles

Constructing a Square (side = 6 cm)

We construct square PQRS with side = 6 cm using ruler and protractor (Method 1) or ruler and compass (Method 2).

Method 1: Using Ruler + Protractor

Step	Construction Action
Step 1	Draw a line PQ = 6 cm using ruler.
Step 2	Place protractor at P. Mark a 90° angle upward. Draw a line through P going upward.
Step 3	Mark point S on this line such that PS = 6 cm.
Step 4	Place protractor at Q. Mark 90° angle upward. Draw a line through Q upward.
Step 5	Mark point R such that QR = 6 cm.
Step 6	Join R and S. Verify RS = 6 cm and all angles = 90°.



Method 2: Using Ruler + Compass (More Precise)

Step	Compass Construction
Step 1	Draw PQ = 6 cm.
Step 2	At P, construct a perpendicular to PQ (place compass at P, draw arcs above and below, join intersection points).
Step 3	With compass set to 6 cm, place tip at P. Mark S on the perpendicular at 6 cm distance.
Step 4	At Q, construct a perpendicular to PQ similarly.
Step 5	With compass set to 6 cm, place tip at Q. Mark R at 6 cm on perpendicular at Q.
Step 6	Join R and S to complete the square.

Why PS = 6 cm? Because all sides of a square are equal, and PQ = 6 cm, so PS must also = 6 cm.

Constructing a Rectangle

◇ Construct – Q1: Rectangle with sides 4 cm and 6 cm (Page 197)

Q1: Draw a rectangle with sides 4 cm and 6 cm. Verify both rectangle properties.

Given: Length = 6 cm, Breadth = 4 cm

Step	Action
Step 1	Draw AB = 6 cm (base).
Step 2	At A, draw a perpendicular. Mark D such that AD = 4 cm.
Step 3	At B, draw a perpendicular. Mark C such that BC = 4 cm.
Step 4	Join D and C. Verify DC = 6 cm.
Step 5	Check: all angles = 90°, AB = DC = 6 cm, AD = BC = 4 cm.

✦ Result: Rectangle ABCD: AB=CD=6 cm, AD=BC=4 cm, all angles=90°. Both R1 and R2 satisfied. ✓

◇ Construct – Q2: Rectangle with sides 2 cm and 10 cm (Page 197)

Q2: Draw a rectangle of sides 2 cm and 10 cm. Verify properties.

Step	Action
Step 1	Draw PQ = 10 cm.
Step 2	At P, construct perpendicular. Mark S with PS = 2 cm.
Step 3	At Q, construct perpendicular. Mark R with QR = 2 cm.
Step 4	Join SR. Verify SR = 10 cm.

✦ Result: Rectangle PQRS: PQ=SR=10 cm, PS=QR=2 cm, all angles=90°. Both R1 and R2 satisfied. ✓

◇ Construct – Q3: 4-sided figure, all angles 90° but opposite sides unequal? (Page 197)

Q3: Is it possible to construct a 4-sided figure where all angles = 90° but opposite sides are NOT equal?

Answer: NO. This is not possible.

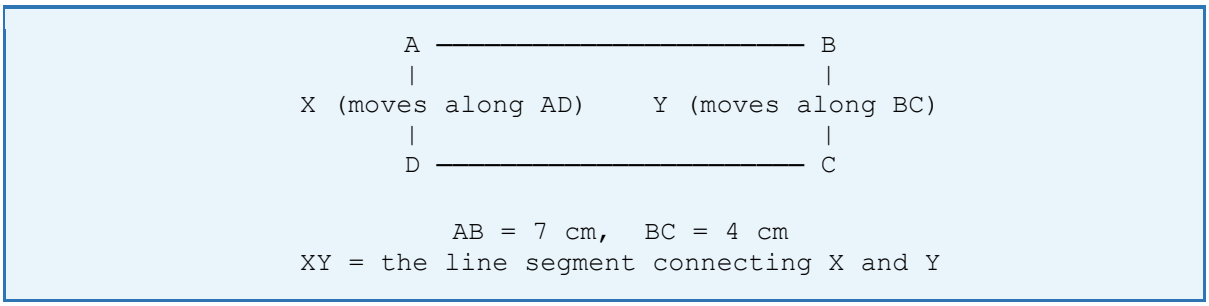
Reason: If all four angles of a quadrilateral are 90°, then opposite sides MUST be equal. This is a mathematical property — a quadrilateral with all right angles must be a rectangle (or square). You cannot have all 90° angles with unequal opposite sides.

✦ **Result: It is NOT possible. A 4-sided figure with all angles = 90° must have equal opposite sides (i.e., it must be a rectangle or square).**

8.4 An Exploration in Rectangles

📌 Moving Points X and Y (Page 197–199)

Construct rectangle ABCD with AB = 7 cm, BC = 4 cm.
X is a point that can move along side AD. Y is a point that can move along side BC.



Q: At which positions will X and Y be closest? Farthest?

Closest: X and Y are closest when XY is perpendicular to both AD and BC — i.e., when XY is parallel to AB. Minimum XY = AB = 7 cm.

Farthest: X and Y are farthest when they are at opposite corners — i.e., X=D and Y=B (or X=A and Y=C). Then XY = diagonal of rectangle = AC or BD.

🔢 Figure It Out – XY Distance Table (Page 198)

Q: Fill the distance table for various positions of X and Y.

Distance of X from A	Distance of Y from B
5 mm	3 cm
1 cm	1 cm
2 cm	4 cm

Q: When X and Y are placed at the SAME distance from A and B respectively, what happens to XY?

Distance of X from A	Distance of Y from B
5 mm	5 mm
1 cm	1 cm
1 cm 5 mm	1 cm 5 mm

Observation 1: XY = AB = 7 cm (always, when distances from A and B are equal).

Observation 2: The figure ABYX becomes a RECTANGLE! (opposite sides equal, all angles 90°).

✦ Result: When X and Y are equidistant from A and B: XY = AB, and ABYX is a rectangle.

Q: How does the farthest distance between X and Y compare to diagonals AC and BD?

✦ Result: The farthest distance between X and Y equals the diagonal of rectangle ABCD. XY_max = AC = BD.

✂ Breaking Rectangles (Page 199)

📐 CONSTRUCT: Rectangle divided into 2 identical squares

Q: Construct a rectangle that can be divided into 2 identical squares.

Given: Rectangle ACDF divided into squares ABEF and BCDE.

Planning: Since both squares are identical, AB = BC. Also each square has all sides equal, so AF = AB = BE = FE.

Key Relation: Length of rectangle AC = AB + BC = 2 × AB = 2 × AF.

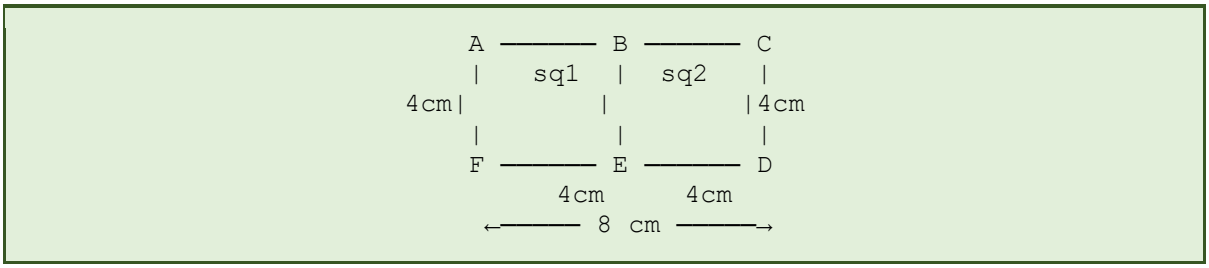
So: Length : Breadth = 2 : 1

Step 1: Choose any length for AF (breadth). Example: AF = 4 cm.

Step 2: Then AC = 2 × 4 = 8 cm (length).

Step 3: Construct rectangle 8 cm × 4 cm.

Step 4: Mark midpoint B of AC. Draw perpendicular at B. This divides rectangle into two 4 cm × 4 cm squares.



✦ Result: Rectangle 8 cm × 4 cm (ratio 2:1) can be divided into 2 identical 4×4 cm squares.

📐 CONSTRUCT: Rectangle divided into 3 identical squares (Page 199–201)

Q: Construct a rectangle that can be divided into 3 identical squares.

Planning: Each square has side = s. Breadth of rectangle = s. Length = 3s. Ratio = 3:1.

Step 1: Choose s = 3 cm (any value). Breadth = 3 cm, Length = 9 cm.

Step 2: Construct 9 cm × 3 cm rectangle.

Step 3: Mark points 3 cm and 6 cm along the length. Draw perpendiculars to divide into three 3×3 squares.

Using compass: Set compass to length s (breadth). Walk along the top edge marking B and C using compass arcs to transfer the length without a ruler.

✦ **Result: Rectangle with ratio 3:1 (e.g., 9 cm × 3 cm) divides into 3 identical squares.**

Q: Give dimensions of a rectangle that CANNOT be divided into 2 identical squares; 3 identical squares.

- Cannot divide into 2 squares: Length = 4 cm, Breadth = 2.5 cm (ratio is not 2:1)
- Cannot divide into 3 squares: Length = 7 cm, Breadth = 2 cm (ratio is not 3:1)

✦ **Result: For 2 squares: length/breadth ≠ 2. For 3 squares: length/breadth ≠ 3.**

CONSTRUCT: Square within a Rectangle (Page 201)

Q: Construct a rectangle 8 cm × 4 cm. Draw a square inside with the same centre.

Given: Rectangle: 8 cm × 4 cm. Square inside with same centre.

Plan: The square's side = breadth of rectangle = 4 cm (fits exactly in the shorter dimension).

Step 1: Construct rectangle ABCD with AB = 8 cm, AD = 4 cm.

Step 2: Mark midpoint M of AB. Since square side = 4 cm, mark P and Q on AB such that PM = QM = 2 cm.

Step 3: Draw perpendiculars at P and Q going to the opposite side CD.

Step 4: The inner square PQRS has side 4 cm and shares the same centre as the rectangle.

✦ **Result: Square of side 4 cm fits symmetrically inside an 8 cm × 4 cm rectangle, sharing the same centre.**

CONSTRUCT: Falling Squares (Page 202)

Q: Construct 'Falling Squares': Three squares of sides 4 cm each, arranged diagonally (staircase pattern).

Step 1: Draw first square (bottom): side 4 cm.

Step 2: The second square starts where the right side of the first square ends at the top-right corner. Shift 4 cm right and 4 cm up.

Step 3: Third square: similarly shifted. Each square shares only a corner with the next.

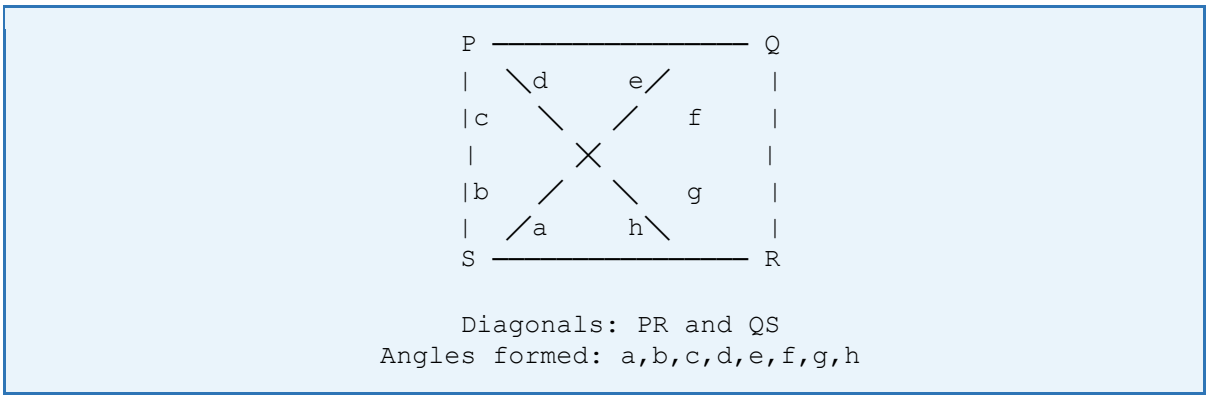
Step 4: For the 3-sizes variant (7 cm, 5 cm, 3 cm): draw the largest first, then place medium square so its bottom-left corner is at the top-right corner of the large, then smallest similarly.

✦ **Result: Falling squares: each square shares its top-right corner with the bottom-left corner of the next square.**

8.5 Exploring Diagonals of Rectangles and Squares

What are Diagonals?

In rectangle PQRS, the diagonals are PR and QS — the two lines connecting opposite corners.



Key Property: In a rectangle, both diagonals are EQUAL in length. PR = QS

Diagonal Angle Properties

When diagonal PR is drawn in rectangle PQRS:

- At corner P: diagonal divides 90° into angles c and d
- At corner R: diagonal divides 90° into angles g and h

Q: Are the angles g and h equal? Are c and d equal?

Answer: In a rectangle, g = d and c = h (alternate interior angles, since PQ ∥ SR and PR is the transversal).

BUT: g = h only if the rectangle is a square. Similarly c = d only in a square.

Diagonal of a rectangle divides its angles EQUALLY only when the rectangle is a square!

Explore: When does diagonal bisect the angles equally? (Page 204)

Q: How should the rectangle be constructed so that the diagonal divides opposite angles into equal parts?

Answer: The diagonal bisects all angles equally only when all 4 sides are equal — i.e., when the rectangle is a SQUARE.

Reason: In a square, each angle (90°) is divided by the diagonal into two equal 45° angles.

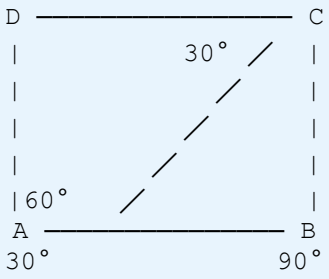
✦ Result: Rectangle where diagonal bisects angles equally = SQUARE (all sides equal).

Construct – Diagonal divides angles into 60° and 30° (Page 205)

Q1: Construct a rectangle in which one diagonal divides opposite angles into 60° and 30°.

Given: Rectangle ABCD where diagonal AC divides angle A into 60° and 30°.

Step	Construction
Step 1	Draw AB with arbitrary length (e.g., 5 cm).
Step 2	At B, construct a 90° angle upward. Draw a vertical line through B.
Step 3	At A, measure 60° angle using protractor. Draw line from A at 60° to AB. This line meets the vertical at point C.
Step 4	At A, the diagonal AC divides angle A: one part = 60° (to AC), other part = 30° (AC to AD).
Step 5 Method 1	At C, draw perpendicular to BC. This gives point D.
Step 5 Method 2	With compass set to BC, place tip at A. Mark D on vertical through A at distance = BC.
Step 6	Join CD. ABCD is the required rectangle.



Diagonal AC divides angle A into 60° + 30° = 90°

✦ **Result: Rectangle constructed where diagonal divides angle A into 60° and 30°.**

Construct – Side 5 cm, Diagonal 7 cm (Page 208)

Q2: Construct a rectangle where one side = 5 cm and diagonal = 7 cm.

Given: One side CD = 5 cm, diagonal DB = 7 cm.

Step	Construction
Step 1	Draw CD = 5 cm.
Step 2	At C, draw a perpendicular line l (vertical). Point B is somewhere on l.
Step 3	B is on line l AND is 7 cm from D (the diagonal length).
Step 4 Method 1	With D as centre, radius 7 cm, draw a full circle. Where circle meets line l = point B.
Step 4 Method 2	Draw only the arc near line l (more efficient, same result).

Step 5	Mark B at the intersection of circle/arc with line l.
Step 6	At D and B, draw perpendiculars to DC and BC respectively. Their intersection = point A.
Step 7	ABCD is the required rectangle. Verify: CD = AB = 5 cm, DB = AC = 7 cm.

💡 Key Idea: B is the intersection of (i) the perpendicular at C and (ii) the circle of radius 7 cm centred at D.

✦ **Result: Rectangle constructed with side = 5 cm and diagonal = 7 cm.**

◇ All Construct Questions – Section 8.5 (Page 211)

Q1: Construct a rectangle where diagonal divides opposite angles into 50° and 40°.

Method: Same as 60°/30° construction. At A, draw AB arbitrary. At B, draw 90° vertical. At A, draw 50° to AB to get diagonal direction. The line meets vertical at C. Complete rectangle using perpendiculars.

✦ **Result: Rectangle where diagonal creates 50° and 40° at each corner.**

Q2: Construct rectangle where diagonal divides opposite angles into 45° and 45°. Observe the sides.

Construction: Same method. At A, draw 45° line. This meets the vertical at C.

Observation: When diagonal divides each angle into 45°+45°, the two sides of the rectangle become EQUAL. The rectangle becomes a SQUARE!

✦ **Result: When diagonal bisects 90° into 45°+45°, the shape is a SQUARE (all sides equal).**

Q3: Construct a rectangle with one side = 4 cm and diagonal = 8 cm.

Step	Action
Step 1	Draw PQ = 4 cm.
Step 2	At Q, construct perpendicular line l.
Step 3	With P as centre, radius 8 cm, draw arc to cut line l at R.
Step 4	At P and R, draw perpendiculars. Intersection = S.
Step 5	PQRS is the rectangle. PS = QR = other side. Verify diagonal = 8 cm.

✦ **Result: Rectangle PQRS: PQ = 4 cm, diagonal PR = 8 cm.**

Q4: Construct a rectangle with one side = 3 cm and diagonal = 7 cm.

Method: Identical to Q3. Draw AB = 3 cm. At B draw perpendicular. Draw arc of radius 7 cm from A to find C. Complete rectangle.

✦ **Result: Rectangle ABCD: AB = 3 cm, diagonal AC = 7 cm.**

8.6 Points Equidistant from Two Given Points

Core Concept

How do we find a point that is exactly 5 cm from BOTH point B and point C?

All points at distance r from B lie on a circle centred at B with radius r. Similarly for C. The point(s) equidistant from both B and C lie at the INTERSECTION of the two circles.

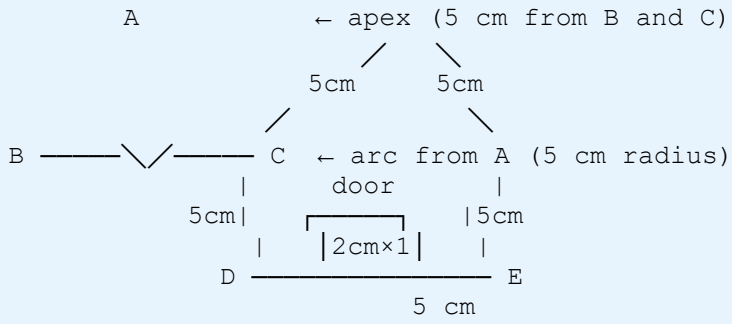
Construct – The House (Page 211–214)

Q: Recreate the house figure where ALL lines forming the border are of length 5 cm.

Given: All sides = 5 cm. Figure has: rectangle body BCDE + triangular roof with arc + small door inside.

Step	Construction
Step 1	Draw DE = 5 cm (base). Mark D and E.
Step 2	At D, draw perpendicular upward. Mark B at 5 cm (so DB = 5 cm).
Step 3	At E, draw perpendicular upward. Mark C at 5 cm (so EC = 5 cm).
Step 4	Join BC = 5 cm. Now rectangle BCDE is ready.
Step 5	Draw small door: a 1cm×2cm rectangle in centre of DE.
Step 6	To find roof apex A: A must be 5 cm from both B and C.
Step 7	With B as centre, radius 5 cm, draw an arc above BC.
Step 8	With C as centre, radius 5 cm, draw an arc (same radius). Where they intersect = point A.
Step 9	Join A to B and A to C with straight lines (AB = AC = 5 cm).
Step 10	From A, draw arc of radius 5 cm curving from B to C (the doorway arc). This is

	centred at A, radius = 5 cm, going from B to C downward.



🤔 Think: Was it necessary to draw full circles to find A? No! We only needed the ARCS near the intersection point. Method 2 draws only arcs, saving time.

✦ Result: House constructed: all sides = 5 cm. Key tool = intersecting arcs to find equidistant point A.

◇ All Construct Questions – Section 8.6 (Page 215)

Q1: Construct a bigger house where all sides = 7 cm.

Method: Identical to 5 cm house, but use 7 cm everywhere. Rectangle BCDE: each side 7 cm. Apex A: draw arcs of radius 7 cm from B and C. Find intersection. Draw roof lines BA and CA (7 cm each). Draw arc from A (radius 7 cm) touching B and C.

✦ Result: Bigger house: all sides = 7 cm.

Q2: Recreate 'A Person', 'Wavy Wave', and 'Eyes' using ideas from the House construction.

A Person: Use compass arcs for shoulder curves just like the neck of the house arc. Place tip away from the line, use correct radius.

Wavy Wave: Each arc is a semicircle. Tip placed at midpoint of each segment on the central line. Alternate above and below.

Eyes: Two arcs of same radius, tips placed symmetrically above and below the eye axis. Both arcs meet at the eye tips.

✦ Result: All artwork uses the core principle: fix compass tip, set radius, draw arc.

Q3: Is there a 4-sided figure where all sides are equal but it is NOT a square?

Answer: YES! A RHOMBUS has all 4 sides equal but its angles are NOT 90° (unless it's a square).

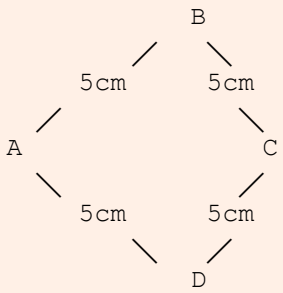
Construction of Rhombus:

Draw AB = 5 cm.

With A as centre, radius 5 cm, draw an arc.

With B as centre, radius 5 cm, draw another arc. Let them intersect at C.

Draw AB and BC. Now with C as centre and A as centre, find D similarly. ABCD is a rhombus — all sides 5 cm but angles ≠ 90°.



Rhombus: all sides = 5 cm
Angles ≠ 90° → NOT a square

✦ Result: YES, a rhombus is a 4-sided figure with all equal sides that is NOT a square (angles ≠ 90°).

Chapter Summary

Concept	Key Points
Circle	All points on circle are equidistant from centre; that distance = radius.
Compass Use	Fix tip at centre; rotate pencil to draw circles/arcs.
Rectangle R1	Opposite sides are equal in length.
Rectangle R2	All 4 angles = 90°.
Square S1	All 4 sides equal.
Square S2	All 4 angles = 90°.
Naming	Valid name = corners in order of travel around the figure.
Rotation	Rotating a square/rectangle keeps its properties unchanged.
Diagonals	Both diagonals of a rectangle are equal in length.
Diagonal Angles	Diagonal bisects corner angles equally ONLY in a square (45°+45°).
Equidistant Point	Point equidistant from 2 points = intersection of equal-radius arcs/circles.
Rhombus	4 equal sides but angles ≠ 90° — NOT a square.