Symmetry Pattern in Nature Drawing: Mirror Axes for Leaves, Flowers, and Shells

Original tasks 1, 2 / complete keys

Task 1

A half-drawn flower has its axis between two petals. On the drawn side, a petal tip is 3.0 cm from the axis and 4.0 cm from the flower base. The petal base corners are 1.0 cm and 2.0 cm from the axis. Describe the matching marks on the blank side.

Answer: The mirrored petal tip is 3.0 cm from the axis on the blank side and 4.0 cm from the base. The mirrored base corners are 1.0 cm and 2.0 cm from the axis, at the same distance from the base as the drawn corners.

Reason: Reflection preserves perpendicular distance to the axis and distance along the axis. Each anchor point is transferred individually.

Check: Measure the petal tip on both sides perpendicular to the axis; both should be 3.0 cm. Measure the base corners; they should be 1.0 cm and 2.0 cm from the axis.

Task 2

A half-drawn shell has a rim point 4.5 cm from the axis and 2.0 cm from the shell base. A spiral point is 1.8 cm from the axis and 3.0 cm from the base. State the matching blank-side positions and one alignment check.

Answer: The mirrored rim point is 4.5 cm from the axis and 2.0 cm from the base. The mirrored spiral point is 1.8 cm from the axis and 3.0 cm from the base. Check that the rim point is 4.5 cm from the axis on both sides.

Reason: Each point is reflected independently using perpendicular distance to the axis and distance along the axis.

Check: Use a ruler at 90 degrees to the axis to measure the rim point on both sides; both should read 4.5 cm.

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Original tasks 3, 4 / complete keys

Task 3

A leaf half has a notch on the outer edge 2.2 cm from the axis and 5.0 cm from the base. The drawn half also has a vein ending 1.6 cm from the axis and 3.5 cm from the base. Describe the blank-side marks and explain how to check the notch.

Answer: Place the mirrored notch 2.2 cm from the axis and 5.0 cm from the base. Place the mirrored vein end 1.6 cm from the axis and 3.5 cm from the base. Check the notch by measuring 2.2 cm perpendicular to the axis on both sides at the same distance from the base.

Reason: The notch and vein end are anchor points; reflection keeps their perpendicular distances and along-axis positions equal.

Check: Measure the notch distance from the axis on both sides; both should be 2.2 cm. Confirm the vein end is 1.6 cm from the axis on both sides.

Task 4

A flower centre is an oval on the axis. On the drawn side, the centre edge is 0.9 cm from the axis. A petal line starts at the centre edge and ends 2.4 cm from the axis at the petal tip. Describe the blank-side centre edge and petal line, and give a tolerance check.

Answer: The blank-side centre edge is 0.9 cm from the axis. The petal line starts at that edge and ends 2.4 cm from the axis at the mirrored petal tip. Check that both centre edges are 0.9 cm from the axis within 0.2 cm.

Reason: The centre is centred on the axis, so its edges are equidistant. The petal line is reflected by transferring its start and end points.

Check: Measure both centre edges perpendicular to the axis; the difference should be 0.2 cm or less in this hypothetical example.

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Source rubric / reflection

- [ ] Mirror axis is clearly drawn as a dashed line and labelled.
- [ ] At least three major anchor points are reflected at equal perpendicular distances within 0.2 cm (hypothetical tolerance).
- [ ] Interior details such as veins or petal lines are reflected in both position and angle.
- [ ] The completed motif reads as a believable leaf, flower, or shell.
- [ ] Any natural variation is intentional and does not break the overall balance.
- [ ] Self-check measurements are recorded for at least three pairs of points.

Reflection: What did you check, what did you change, and what will you try next?