Draw Angel Wings: Layered Feather Rows and Curved Silhouette

Original tasks 1, 2, 3 / complete keys

Task 1

Plan a right-facing wing with shoulder at (0, 0) and tip at (10, 0) cm. The outer arc bulges 3 cm above the midpoint. You will use three rows with feather lengths 1.5 cm, 2.5 cm, and 3.5 cm. State the drawing order and the total planned feather length.

Answer: Draw back row (1.5 cm) first, then middle row (2.5 cm), then front row (3.5 cm). Total planned feather length is 1.5 + 2.5 + 3.5 = 7.5 cm.

Reason: Back-to-front order lets each row overlap the one behind. Adding the three row lengths gives the total planned feather length.

Check: Confirm the order is back, middle, front and that 1.5 + 2.5 + 3.5 = 7.5 cm.

Task 2

A wing silhouette has an outer arc that bulges 5 cm from a 14 cm shoulder-to-tip line. You draw six feathers in the back row, each 2 cm long, and eight feathers in the middle row, each 3 cm long. What is the combined feather length of these two rows, and which row should be drawn first?

Answer: Combined length is (6 × 2) + (8 × 3) = 12 + 24 = 36 cm. The back row is drawn first.

Reason: Multiply feather count by length for each row, then add. The back row is drawn first so the middle row can overlap it.

Check: Recompute 6 × 2 = 12 and 8 × 3 = 24, then 12 + 24 = 36 cm; confirm back row first.

Task 3

You are drawing a left-facing wing. The shoulder is at (0, 0) and the tip at (−9, 0) cm. The outer arc bulges 3 cm above the midpoint. Describe where the feathers point and which row is drawn first.

Answer: Feathers point outward and slightly downward to the left, toward the outer arc. The back row is drawn first, then middle, then front.

Reason: Mirroring the right-facing method keeps the outer arc convex and the layering order unchanged.

Check: Check that feather tips trend left and downward and that the drawing order is back, middle, front.

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Original tasks 4 / complete keys

Task 4

A front row has 7 feathers of 4 cm each. A middle row has 9 feathers of 3 cm each. A back row has 11 feathers of 2 cm each. Compute each row's total length and the grand total. State one check that the layering is correct.

Answer: Front: 7 × 4 = 28 cm. Middle: 9 × 3 = 27 cm. Back: 11 × 2 = 22 cm. Grand total: 28 + 27 + 22 = 77 cm. Layering check: each front feather overlaps the middle row and each middle feather overlaps the back row, with tips near the outer curve.

Reason: Multiply count by length per row, then sum. Layering is correct when rows are drawn back to front and overlaps are visible.

Check: Verify 28 + 27 + 22 = 77 cm and inspect that front overlaps middle and middle overlaps back.

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Source rubric / reflection

- [ ] Curved silhouette is smooth and readable, with a convex outer edge and a shallower inner edge.
- [ ] Three feather rows are present and drawn back to front, each overlapping the row behind.
- [ ] Feather lengths increase from back row to front row.
- [ ] Feather tips stay on or near the outer silhouette curve.
- [ ] Shading darkens feather bases and adds shadow under overlapping edges with a consistent light direction.
- [ ] Valid alternatives are accepted: feather count, exact curvature, and feather shape may vary if layering and silhouette remain clear.

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