Cello Drawing: Body Outline, F-Holes, and Bow Geometry

Original tasks 1, 2, 3, 4 / complete keys

Task 1

A cello body is 20 cm long. Using the lesson convention, calculate the upper-eye and lower-eye levels from the top, and the vertical span of each f-hole.

Answer: Upper eye = 3/8 × 20 = 7.5 cm. Lower eye = 5/8 × 20 = 12.5 cm. Span = 12.5 − 7.5 = 5 cm.

Reason: Multiply body length by the stated fractions and subtract to find the span.

Check: Recompute both fractions and confirm the span equals the difference; units are centimetres.

Task 2

A bow is drawn at 30 degrees to vertical with length 18 cm. Calculate its vertical rise and horizontal run, using sine and cosine rounded to one decimal place.

Answer: Vertical rise = 18 × cos 30 ≈ 15.6 cm. Horizontal run = 18 × sin 30 = 9.0 cm.

Reason: The bow line forms a right triangle with the vertical; the vertical component uses cosine and the horizontal component uses sine.

Check: Square both components, add, and take the square root; the result should be approximately 18 cm.

Task 3

A drawing has body length 16 cm and maximum lower-bout half-width 5 cm. Using the lesson convention, calculate the horizontal distance from the midline to each f-hole centre.

Answer: Distance = 1/5 × 5 = 1 cm from the midline on each side.

Reason: The convention places each f-hole centre at one-fifth of the maximum lower-bout half-width.

Check: Multiply the half-width by 0.2 and confirm both sides use the same value.

Task 4

A student's body is 28 cm long. They mark left half-widths of 4, 3, 2, 3, 5, 6, 5, and 4 cm at the eight levels. State the right half-widths needed for symmetry and the total width at the widest level.

Answer: Right half-widths must equal the left: 4, 3, 2, 3, 5, 6, 5, 4 cm. Widest level is 6 cm half-width, so total width = 12 cm.

Reason: Symmetry requires equal offsets from the midline; total width is twice the half-width.

Check: Compare each left and right pair and double the largest half-width.

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Source rubric / reflection

- [ ] Body outline is closed and symmetric about the midline within the chosen tolerance.
- [ ] Eight reference levels are marked and used to place half-widths.
- [ ] Upper and lower f-hole eyes sit at matching levels left and right.
- [ ] F-holes are mirror images and judged by placement and proportion, allowing valid curve variation.
- [ ] Bow length is about three-quarters of body length and matches the chosen angle.
- [ ] Frog and tip are present and correctly positioned at the ends of the bow.
- [ ] Checkpoint measurements are recorded and compared.

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