# Goat Horns Drawing: Ridged Taper and Backward Curve

Original tasks 1, 2, 3 / complete keys

Task 1

A horn has a 3 cm base width and a 9 cm centerline divided into three equal segments. The planned widths are 3.0, 2.0, 1.0, and 0.5 cm. State the width at each division and tip, and explain how to check taper.

Answer: Widths are 3.0 cm at the base, 2.0 cm after the first division, 1.0 cm after the second division, and 0.5 cm at the tip. Check taper by measuring each width with a ruler and confirming the sequence decreases without sudden jumps.

Reason: The four widths correspond to the base, two interior divisions, and the tip. A steady decrease shows taper.

Check: Measure each marked width and compare to the planned list; all four values should match within your chosen tolerance.

Task 2

A centerline is 8 cm long and you plan six ridges. Where do you place the ridge marks, and how do you check spacing?

Answer: Place ridge marks at equal centerline intervals of 8 divided by 6, about 1.33 cm apart along the curve. Check spacing by measuring the distance between adjacent marks along the centerline; each gap should be about 1.33 cm within your tolerance.

Reason: Ridges are spaced along the curved centerline, so the total centerline length is divided by the number of gaps.

Check: Measure each adjacent gap along the centerline and confirm they are equal within your chosen tolerance.

Task 3

A horn base is 2.4 cm wide and the tip is 0.6 cm wide. At a point where the horn width is 1.2 cm, how long should the ridge be, and why?

Answer: The ridge should be 1.2 cm long because ridge length matches the local horn width. The width 1.2 cm is halfway between 2.4 cm and 0.6 cm, so the ridge spans the full local width.

Reason: Ridges cross the horn surface, so their length equals the horn width at that position.

Check: Measure the horn width at the ridge position and compare it to the drawn ridge length; they should match.

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Original tasks 4 / complete keys

Task 4

A drawing shows a centerline that shifts 4 cm backward over 10 cm of length, with widths 2.5, 1.8, 1.2, 0.8, and 0.4 cm. List two checks that confirm the backward curve and taper are consistent.

Answer: First, lay a straight edge between base center and tip and confirm the centerline bows consistently toward the recorded 4 cm backward shift; do not assume a fixed one-third bow. Second, measure the five widths in order and confirm they decrease steadily from 2.5 cm to 0.4 cm without sudden jumps.

Reason: The straight-edge check verifies the backward curve, and the width sequence verifies taper.

Check: Perform both measurements with a ruler and compare the results to the stated values within your chosen tolerance.

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Source rubric / reflection

- [ ] Base oval is present and its center is marked.
- [ ] Centerline is smooth and curves backward without sharp kinks.
- [ ] Widths decrease steadily from base to tip according to the recorded plan.
- [ ] Ridges are spaced evenly along the centerline, not by vertical height.
- [ ] Ridge lengths match the local horn width.
- [ ] Side edges are smooth and the tip width matches the plan.
- [ ] Valid alternatives are accepted when taper and ridge spacing remain consistent with the recorded measurements.

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