Cross-Contour Drawing: Bowling Ball and Pin Volume

Original tasks 1, 2 / complete keys

Task 1

A pin outline is 12 cm tall. The neck is 3 cm wide and the body is 6 cm wide. Using the compression convention, describe how you would space five cross-contour arcs from top to base.

Answer: Place five guide points that divide the 12 cm vertical axis into six equal intervals of 2 cm each, at 2 cm, 4 cm, 6 cm, 8 cm, and 10 cm from the top (hypothetical spacing). Draw one arc through each point. Near the neck, arcs are short and tightly curved; near the body, arcs are longer and flatter; the base arc is flat. Under the compression convention, tighten spacing where the pin narrows or turns away (neck) and widen it where the body faces you, changing gradually from top to base. No arcs cross, and each crosses the axis at about 90 degrees.

Reason: Compression convention tightens spacing where the form narrows (neck) and widens where it bulges (body). Arc length follows local width. Five points dividing a 12 cm axis into six 2 cm intervals span the full height.

Check: Verify that no arcs cross, that spacing changes gradually, and that each arc crosses the axis at about 90 degrees. Confirm the five guide points span the full 12 cm height.

Task 2

A ball is drawn as a circle 6 cm wide. Using even spacing, place four guide points along the vertical axis and describe the curvature of the arcs.

Answer: Mark the axis and place four guide points at equal intervals (for example, 1.5 cm apart, hypothetical). Draw arcs through each point. The top and bottom arcs are more curved; the middle arcs are flatter. Spacing is even throughout. No lines cross.

Reason: Even spacing is a valid convention; volume is shown by curvature alone. Stronger curvature near the top and bottom suggests turning.

Check: Confirm equal spacing with a ruler and check that arcs do not intersect.

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Original tasks 3, 4 / complete keys

Task 3

A pin has a narrow neck and a wide body. A learner draws all cross-contour arcs with the same curvature and even spacing. Explain one adjustment to improve volume.

Answer: Adjust curvature: make arcs at the neck tighter and arcs at the body wider. Alternatively, switch to compression spacing: tighter near the neck, wider near the body. State the convention and apply it consistently.

Reason: Uniform curvature and spacing ignore the form's changing width, reducing the sense of volume.

Check: Compare arc curvature to the local outline width; check that spacing changes gradually if using compression.

Task 4

A ball drawing has cross-contour lines that cross each other near the edge. Describe a step-by-step fix using guide points.

Answer: Erase the crossing lines. Mark a vertical axis and place guide points at equal intervals. Draw one arc at a time, starting from the top, and check that it meets the outline without crossing previous arcs. Adjust the guide point if needed. Continue downward.

Reason: Crossing lines break the surface-reading convention. Guide points keep arcs ordered and separate.

Check: Trace each arc to confirm no intersections and that each crosses the axis at about 90 degrees.

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Source rubric / reflection

- [ ] Cross-contour lines cross the main axis at approximately 90 degrees.
- [ ] Lines follow the surface curvature: arcs bow outward on the ball; arcs follow neck and body on the pin.
- [ ] Spacing convention is consistent: either even spacing or compression spacing is applied throughout.
- [ ] No cross-contour lines intersect each other.
- [ ] No shading or highlights are used; volume is shown by line alone.
- [ ] Valid alternatives are accepted if the convention is stated and applied consistently.

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