Axonometric Chair Drawing: Three-Axis Block-In and Seat Plane

Original tasks 1, 2, 3 / complete keys

Task 1

Construct a chair with a 4-by-3 seat, 3-unit legs, and a 4-unit back using H vertical, W at 30 degrees right, and D at 30 degrees left. All units are hypothetical.

Answer: A parallelogram seat 4 units along W and 3 units along D; four 3-unit vertical legs from the corners; two 4-unit verticals from rear corners with a top edge parallel to the rear seat edge; back panel closed with axis-parallel lines.

Reason: The seat uses W and D only; legs and back use H for height; the back top follows the rear seat edge direction.

Check: Use a ruler to confirm opposite seat edges are parallel and every leg is vertical; measure the labeled unit to verify 4, 3, 3, and 4.

Task 2

Redraw the same chair but raise the seat by 2 units along H while keeping the leg length 3 units. Describe the new positions.

Answer: The seat parallelogram moves up 2 units; leg tops move with it; leg bottoms are 3 units below the new corners; the back rises from the new rear corners by 4 units.

Reason: Raising the seat changes only its H position; W and D dimensions stay the same, and legs remain vertical.

Check: Confirm the seat edges are still parallel to W and D, legs are vertical and 3 units long, and the back is 4 units above the new rear edge.

Task 3

A student draws a seat 5 units wide along W and 4 units deep along D but closes it with a horizontal line. Identify the error and state the correction.

Answer: The closing line is not parallel to D or W. Replace it with a line parallel to D from the width endpoint and a line parallel to W from the depth endpoint; their intersection closes the parallelogram.

Reason: In axonometric projection, the seat's opposite edges must be parallel to the two receding axes.

Check: Compare each seat edge with the labeled W and D axes; every edge should match one of them.

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Original tasks 4 / complete keys

Task 4

Design a chair with a 7-by-4 seat and 5-unit legs, but choose your own receding angles and label them. State one check you will use.

Answer: Any labeled angles are acceptable if the seat is a parallelogram using W and D, legs are vertical and 5 units, and the back follows the rear edge. A valid check is comparing opposite edges with a ruler for parallelism.

Reason: The convention allows chosen angles; consistency and labeling matter more than a specific angle.

Check: Verify the recorded angles match the drawn axes and that all edges are parallel to H, W, or D.

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Source rubric / reflection

- [ ] Three axes are drawn, labeled, and their angles recorded.
- [ ] Seat is a parallelogram with edges parallel to W and D.
- [ ] All four legs are parallel to H and equal in length within the chosen convention.
- [ ] Back panel edges are parallel to H and the rear seat edge.
- [ ] Construction lines are visible enough to check alignment.
- [ ] Valid alternatives are accepted if axis consistency and labeled conventions are maintained.

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