Isometric Headgear Drawing: Shell, Straps and Buckle Axes

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

Task 1

An axis box is 4 units wide, 4 units deep and 3 units high. A side strap starts at the lower shell ellipse and runs 1 unit down. How many grid steps long is the strap, and which axis is it parallel to?

Answer: 1 grid step, parallel to the vertical axis.

Reason: The strap length is given directly as 1 unit, and a strap running down the side of the shell follows the vertical isometric axis.

Check: Count the steps on your drawing from the attachment point to the strap end and confirm the line is parallel to the vertical axis.

Task 2

A buckle is drawn as a rectangle 2 steps along the left diagonal and 1 step along the vertical. What are its two edge lengths in grid units, and which axes do they follow?

Answer: 2 units along the left diagonal axis and 1 unit along the vertical axis.

Reason: The rectangle edges are defined by the step counts along the two named isometric directions.

Check: Measure each edge against the grid and confirm it is parallel to the stated axis.

Task 3

A chin loop hangs 2 units below the shell. The shell centre is 3 units above the base of the axis box. At what height above the base is the bottom of the chin loop?

Answer: 1 unit above the base.

Reason: Subtract the loop drop from the shell centre height: 3 minus 2 equals 1.

Check: Count grid steps upward from the base to the loop bottom and confirm the total is 1.

Task 4

A front strap band is 1 unit wide and crosses a flat front face 4 units tall. If the band is centred, how many units of flat face remain above and below it?

Answer: 1.5 units above and 1.5 units below.

Reason: The band occupies 1 unit of the 4-unit face, leaving 3 units split equally: 3 divided by 2 equals 1.5.

Check: Measure the remaining face above and below the band on the grid and confirm both equal 1.5 units.

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Source rubric / reflection

- [ ] Axis box uses three isometric directions consistently.
- [ ] Shell dome is centred and built from aligned ellipses or stacked bands.
- [ ] Strap bands follow the shell curve and stay parallel to isometric axes on flat faces.
- [ ] Chin loop is centred and its sides are vertical.
- [ ] Buckle rectangle is aligned to the diagonal and vertical axes with countable grid steps.
- [ ] All measurements use one stated unit, with any numerical values labelled as hypothetical examples.
- [ ] Valid alternatives such as stacked ellipses or freehand curves are accepted if alignment and centring checks pass.

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