Drawing Ellipses on Human Form: Cross-Sections for Limbs and Torso

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

Task 1

A hypothetical leg section is 10 cm wide and 6 cm deep. State the long and short axes and their ratio.

Answer: Long axis 10 cm, short axis 6 cm, ratio 10:6, which simplifies to 5:3.

Reason: The long axis is the visible width; the short axis is the depth. The ratio compares them in the same unit.

Check: Measure both drawn axes in centimeters and confirm they reduce to 5:3.

Task 2

An arm points toward the viewer. Its midpoint section is 7 cm wide and 3 cm deep. A drawn ellipse measures 7 cm by 5 cm. Is the depth correct?

Answer: No. The reference ratio is 7:3, but the drawn ratio is 7:5, so the short axis is too long.

Reason: A limb pointing toward the viewer should have a shorter depth axis. The drawn short axis exceeds the reference depth.

Check: Compare the drawn short axis (5 cm) with the reference depth (3 cm); shorten it until the ratio is 7:3.

Task 3

A torso leans so its visible width line tilts 20 degrees from horizontal. Describe how to orient the waist ellipse.

Answer: Tilt the long axis about 20 degrees to match the visible width line, then draw the short axis perpendicular to it and centered on the torso centerline.

Reason: The convention ties the long axis to visible width, so a leaning torso requires a tilted ellipse.

Check: Trace the long axis and confirm it aligns with the tilted width line; check that the short axis is perpendicular.

Task 4

A hypothetical knee section is 9 cm wide and 9 cm deep. What shape is the ellipse, and what is the ratio?

Answer: The ellipse is circular because the axes are equal; the ratio is 9:9, or 1:1.

Reason: Equal long and short axes produce a circle under the stated convention.

Check: Measure both axes; if both are 9 cm, the ratio is 1:1 and the ellipse should read as circular.

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Source rubric / reflection

- [ ] Long axis follows the visible width line at the chosen height.
- [ ] Short axis is perpendicular to the long axis and centered on the centerline.
- [ ] Axis ratio is measured and compared with the reference plate or stated example.
- [ ] At least one joint and one midpoint ellipse are placed per limb.
- [ ] Torso ellipses show width versus depth and tilt when the body leans or twists.
- [ ] Construction ellipses are light and do not replace final connecting curves.
- [ ] Valid alternatives are accepted when axis alignment and ratio checks pass.

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