Realistic Glass Drawing: Rim Ellipse, Refraction, Cast Shadow

Original tasks 1, 2, 3 / complete keys

Task 1

A glass rim appears 100 mm wide and 25 mm high. Calculate the half-width and half-height and state the ellipse ratio.

Answer: Half-width 50 mm, half-height 12.5 mm, ratio 4 to 1.

Reason: Divide the width by 2 and the height by 2. The ratio is half-width divided by half-height: 50 divided by 12.5 equals 4.

Check: Multiply the half-height by 4 to recover the half-width: 12.5 times 4 equals 50 mm.

Task 2

A base ellipse appears 80 mm wide and 20 mm high. A rim ellipse appears 80 mm wide and 28 mm high. Which ellipse is shallower, and by how many millimeters of half-height?

Answer: The base ellipse is shallower by 4 mm of half-height.

Reason: Base half-height is 10 mm; rim half-height is 14 mm. The difference is 4 mm.

Check: Add 4 mm to the base half-height to get 14 mm, matching the rim half-height.

Task 3

Light comes from the upper left. A cast shadow is measured at 60 mm long and 30 mm wide. Describe where to place the shadow relative to the glass base and what to check.

Answer: Place the shadow to the lower right, touching the base ellipse and tapering away. Check that the shadow direction is opposite the upper-left light and that the length matches 60 mm.

Reason: A shadow falls opposite the light source. The measured length and width guide the shape, and the contact point anchors the glass.

Check: Mark the light arrow and confirm the shadow points away from it; measure the shadow length against 60 mm.

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Original tasks 4 / complete keys

Task 4

You have drawn three refraction lines, but one crosses the glass body without touching any edge or water line. What should you do, and why?

Answer: Remove or redraw that line so it starts and ends at a glass edge or water line.

Reason: Refraction lines represent light bending at glass boundaries; a line with no boundary has no cause and weakens the realism.

Check: Trace each refraction line with your finger; every line must meet an edge or water line at both ends.

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Source rubric / reflection

- [ ] Rim ellipse is measured and symmetric about the vertical center line.
- [ ] Base ellipse is shallower than the rim ellipse and shares the center line.
- [ ] Refraction lines touch plausible glass edges or water lines.
- [ ] Cast shadow is opposite the marked light source and touches the base.
- [ ] Measurements and units are labeled and consistent.
- [ ] Valid alternative proportions are accepted when supported by measurements.

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