Hockey Puck Isometric Drawing: Cylinder and Ellipse Practice

Original tasks 1, 2, 3 / complete keys

Task 1

A puck is drawn with a top ellipse whose four tangent points are 4 cm from the center along each 30-degree axis. What is the chosen diameter in this drawing?

Answer: 8 cm.

Reason: The tangent points are half the diameter from the center along the isometric axes, so the full diameter is twice 4 cm.

Check: Measure the distance from the center to one tangent point and double it; confirm all four tangent points are the same distance.

Task 2

A student draws the top ellipse but the curve crosses outside the rhombus sides. Which convention condition is violated, and how should it be fixed?

Answer: The ellipse must be tangent to the rhombus sides, not cross them. Redraw the curve so it touches each side at its midpoint without passing outside.

Reason: Tangency to the bounding rhombus is the defined construction condition for the isometric ellipse.

Check: Trace each rhombus side and confirm the ellipse touches at the midpoint and stays inside the rhombus elsewhere.

Task 3

The top center is at a marked point and the thickness is 3 cm. Where is the bottom center located relative to the top center?

Answer: 3 cm directly below the top center along the vertical axis.

Reason: In isometric projection, vertical offsets remain vertical and use the chosen thickness.

Check: Measure the vertical distance between the two centers and compare it to the chosen thickness.

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Original tasks 4 / complete keys

Task 4

A drawing shows side-wall lines that slant 10 degrees from vertical. Is this acceptable under the convention? Explain.

Answer: No. Side-wall lines must be vertical in isometric projection. Redraw them parallel to the vertical axis.

Reason: The convention defines vertical edges as true vertical; slanting them changes the projection.

Check: Compare each side-wall line to the vertical axis with a straightedge or protractor.

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Source rubric / reflection

- [ ] Three isometric axes are drawn at 30 degrees from horizontal with a true vertical.
- [ ] Top and bottom ellipses are tangent to their bounding rhombus sides.
- [ ] Ellipse major and minor axes align with the rhombus diagonals.
- [ ] Side-wall lines are vertical and connect corresponding tangent points.
- [ ] Top and bottom ellipses use the same chosen diameter.
- [ ] Construction lines are either consistently light or consistently erased.
- [ ] Independent redraw reproduces axis angles and tangency without copying.

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