Isometric Sports Car Body Drawing: Axes, Wheel Arches, and Body Planes

Original tasks 1, 2, 3 / complete keys

Task 1

A car body is 40 units long with a 20-unit wheelbase. If the front axle is 10 units from the front, how far is the rear axle from the rear?

Answer: 10 units.

Reason: The wheelbase is 20 units, so the rear axle is 20 units behind the front axle. The front axle is 10 units from the front, so the rear axle is 10 + 20 = 30 units from the front. The car is 40 units long, so the rear axle is 40 - 30 = 10 units from the rear.

Check: Add the front overhang, wheelbase, and rear overhang: 10 + 20 + 10 = 40 units, matching the car length.

Task 2

On an isometric side plane, a wheel arch ellipse has a major axis of 14 units and a minor axis of 9 units. A wheel drawn inside has a diameter of 11 units. Is the wheel smaller than the arch opening in both directions?

Answer: No.

Reason: The arch major axis is 14 units and the wheel diameter is 11 units, so the wheel is smaller along the major direction. The arch minor axis is 9 units, which is less than 11 units, so the wheel is not smaller in the minor direction. Therefore the wheel is not smaller in both directions; it exceeds the minor axis.

Check: Compare 11 with 14 and with 9. Since 11 is greater than 9, the wheel would protrude beyond the arch in the minor direction.

Task 3

A cabin box is 16 units long, 12 units wide, and 6 units high. The lower hull is 18 units wide. If the cabin is centered on the width axis, how much hull width remains on each side?

Answer: 3 units on each side.

Reason: The hull width is 18 units and the cabin width is 12 units. The difference is 18 - 12 = 6 units. Centering the cabin divides the remaining width equally: 6 / 2 = 3 units on each side.

Check: Add the three widths across: 3 + 12 + 3 = 18 units, matching the hull width.

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Original tasks 4 / complete keys

Task 4

A windshield top edge is shifted back 5 units along the length axis from a base position. If the cabin length is 16 units and the windshield base is 4 units from the cabin front, what is the remaining roof length along the length axis?

Answer: 7 units.

Reason: The windshield base is 4 units from the cabin front. The top edge is shifted back 5 units from the base, so the roof begins 4 + 5 = 9 units from the cabin front. The cabin is 16 units long, so the remaining roof length is 16 - 9 = 7 units.

Check: Add the base offset, the shift, and the roof length: 4 + 5 + 7 = 16 units, matching the cabin length.

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Source rubric / reflection

- [ ] Three isometric axes are present and consistently used.
- [ ] Lower hull and cabin are blocked with stated length, width, and height units.
- [ ] Wheel arches are ellipses on the side planes, centered on measured axle positions.
- [ ] Body planes are flat, bounded by clear edges, and read as hood, windshield, roof, and rear deck.
- [ ] Proportions match the stated arithmetic, and valid alternative choices are internally consistent.

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