Rocket Ship Contour Drawing: Edge-Line Practice

Original tasks 1, 2, 3 / complete keys

Task 1

A reference rocket is 8 cm tall and its widest body width is 3 cm. Your panel is 12 cm tall. Compute the scale factor and the panel widest body width.

Answer: Scale factor = 12 / 8 = 1.5. Panel widest body width = 3 cm × 1.5 = 4.5 cm.

Reason: Divide panel height by reference height to get the scale factor, then multiply the reference width by the same factor.

Check: Verify that 4.5 cm / 3 cm equals 1.5, matching the height ratio 12 cm / 8 cm.

Task 2

On a reference rocket, the nose tip is at 0 cm and the nozzle bottom is at 9 cm. A fin attachment point is at 5 cm from the nose tip. Using a scale factor of 2, where is the fin attachment point on the panel measured from the nose tip?

Answer: 5 cm × 2 = 10 cm from the nose tip on the panel.

Reason: Multiply the reference distance from the nose tip by the scale factor; keep the same reference point.

Check: Confirm that 10 cm / 5 cm = 2, and that the total panel height would be 9 cm × 2 = 18 cm.

Task 3

You trace a rocket outline and measure the fin span on the reference as 4 cm. On your redrawn panel the fin span is 6.2 cm. Your scale factor is 1.5. Is the redrawn fin span within a 0.5 cm tolerance of the expected value?

Answer: Expected fin span = 4 cm × 1.5 = 6 cm. Difference = 6.2 − 6 = 0.2 cm, which is within 0.5 cm tolerance.

Reason: Compute the expected panel value using the scale factor, then subtract to find the difference and compare to tolerance.

Check: Recompute 4 × 1.5 = 6 and 6.2 − 6 = 0.2; confirm 0.2 ≤ 0.5.

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Original tasks 4 / complete keys

Task 4

A reference rocket has three widths: nose base 2 cm, widest body 3 cm, fin span 5 cm. Your panel is 1.2 times the reference height. List the three expected panel widths and state one valid alternative fin span if your tolerance is 0.4 cm.

Answer: Expected widths: nose base 2 × 1.2 = 2.4 cm; widest body 3 × 1.2 = 3.6 cm; fin span 5 × 1.2 = 6 cm. A valid alternative fin span is any value from 5.6 cm to 6.4 cm (6 ± 0.4 cm).

Reason: Multiply each reference width by the scale factor; the tolerance defines an acceptable range around the expected fin span.

Check: Check each multiplication and confirm the alternative range endpoints are 6 − 0.4 = 5.6 and 6 + 0.4 = 6.4.

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Source rubric / reflection

- [ ] Edge order follows the sequence: nose, body sides, fins, nozzle rim.
- [ ] A light centerline is present on both reference and panel.
- [ ] Three widths (nose base, widest body, fin span) are measured and compared.
- [ ] Line continuity: each edge drawn as one stroke where possible.
- [ ] No internal detail or shading added.
- [ ] Valid alternatives: fin shape may vary if attachment points and span match within tolerance.

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