Negative Space Turtle Drawing: Outline and Gap Study

Original tasks 1, 2, 3 / complete keys

Task 1

A turtle reference has shell width 50 mm. The rear-flipper gap is 10 mm narrow and 15 mm wide. Your sketch has shell width 50 mm, rear gap 12 mm narrow and 18 mm wide. Calculate the ratios and say whether the sketch gap is too wide, too narrow, or acceptable within 0.05.

Answer: Reference: 10/50 = 0.20 narrow; 15/50 = 0.30 wide. Sketch: 12/50 = 0.24 narrow; 18/50 = 0.36 wide. Both differ by 0.04 and 0.06; the wide gap exceeds 0.05, so narrow the wide part slightly.

Reason: Divide each gap width by shell width. Compare sketch ratios to reference ratios. A difference up to 0.05 is acceptable; 0.06 is outside that band.

Check: Re-measure the wide rear gap after adjustment and confirm the new ratio is within 0.05 of 0.30.

Task 2

A head-space crescent measures 9 mm at its narrowest against a shell width of 45 mm. What is the ratio? If a second sketch uses a 60 mm shell and the same ratio, what narrow head-space width should it show?

Answer: Ratio = 9/45 = 0.20. For a 60 mm shell, narrow head space = 0.20 × 60 = 12 mm.

Reason: The ratio is gap divided by shell width. Multiply the ratio by the new shell width to find the corresponding gap.

Check: Divide 12 by 60 to confirm the result is 0.20.

Task 3

You measure a front-flipper gap as 14 mm and the shell as 70 mm. A classmate measures the same gap as 1.4 cm and the shell as 7 cm. Are the ratios the same? Show the arithmetic.

Answer: Yes. 14/70 = 0.20 and 1.4/7 = 0.20. The units differ but the ratios match because both measurements were converted consistently within each pair.

Reason: A ratio is unitless when both quantities use the same unit. Convert centimeters to millimeters or compare directly; 1.4 cm equals 14 mm and 7 cm equals 70 mm.

Check: Convert both classmate measurements to millimeters and recalculate: 14/70 = 0.20.

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Original tasks 4 / complete keys

Task 4

A sketch has shell width 64 mm. The three gap ratios should be 0.15, 0.25, and 0.35. Calculate the target gap widths in millimeters, then state one check you would perform after drawing.

Answer: Targets: 0.15 × 64 = 9.6 mm; 0.25 × 64 = 16 mm; 0.35 × 64 = 22.4 mm. Check: measure each drawn gap and divide by 64; each result should be within 0.05 of its target ratio.

Reason: Multiply each ratio by the shell width. After drawing, reverse the calculation by dividing measured gap width by shell width.

Check: Use a ruler on the actual sketch, record each gap in millimeters, and compare the three calculated ratios to the targets.

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Source rubric / reflection

- [ ] Three turtle-specific negative gaps are identified and labeled: shell surround, flipper gaps, head space.
- [ ] Gap widths are measured in one consistent unit and compared to shell width by ratio.
- [ ] At least two gap ratios match the reference within 0.05, or corrections are clearly stated.
- [ ] Labels use baseline-to-midline x-height and do not obscure gap boundaries.
- [ ] Valid alternative orientations are accepted if gap zones and ratio checks remain consistent.

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