Ratio Checks for Arm and Leg Proportions in Figure Drawing

Original tasks 1, 2, 3 / complete keys

Task 1

A drawn figure is 30 cm from baseline to head midline. The drawn arm from shoulder joint center to wrist crease is 12 cm. Compute the drawn arm-to-body ratio to two decimal places.

Answer: 0.40

Reason: Divide arm length by total height: 12 ÷ 30 = 0.40. Both measurements are in centimeters, so the ratio is unitless.

Check: Reverse the division: 0.40 × 30 = 12 cm, which matches the measured arm length.

Task 2

A reference figure is 25 cm tall. Its leg from hip joint center to ankle bone is 11 cm. A drawing of the same figure has total height 50 cm and drawn leg length 20 cm. Compute the reference leg ratio and the drawn leg ratio, then state the difference to two decimal places.

Answer: Reference ratio 0.44; drawn ratio 0.40; difference 0.04.

Reason: Reference: 11 ÷ 25 = 0.44. Drawn: 20 ÷ 50 = 0.40. Difference: 0.44 − 0.40 = 0.04. Units are centimeters for lengths and unitless for ratios.

Check: Add the difference back to the drawn ratio: 0.40 + 0.04 = 0.44, matching the reference ratio.

Task 3

A figure is 40 cm tall. You want a hypothetical arm-to-body ratio of 0.35 using the shoulder-to-wrist convention. What arm length in centimeters should the drawing have?

Answer: 14 cm

Reason: Multiply total height by the chosen ratio: 40 × 0.35 = 14 cm. The ratio is a hypothetical example for this exercise.

Check: Divide the result by total height: 14 ÷ 40 = 0.35, matching the chosen ratio.

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Original tasks 4 / complete keys

Task 4

A drawing is 60 cm tall. Its arm from shoulder joint center to wrist crease is 18 cm, and its leg from hip joint center to ankle bone is 27 cm. Compute both drawn ratios to two decimal places and state which limb ratio is larger.

Answer: Arm ratio 0.30; leg ratio 0.45; the leg ratio is larger.

Reason: Arm: 18 ÷ 60 = 0.30. Leg: 27 ÷ 60 = 0.45. Compare 0.30 and 0.45; 0.45 is larger. All lengths are in centimeters.

Check: Multiply each ratio by total height: 0.30 × 60 = 18 cm and 0.45 × 60 = 27 cm, matching the measured lengths.

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Source rubric / reflection

- [ ] Landmarks are labeled and used consistently on reference and drawing.
- [ ] All measurements use one stated unit.
- [ ] Arm ratio is computed as arm length divided by total height.
- [ ] Leg ratio is computed as leg length divided by total height.
- [ ] Self-check table includes reference and drawn ratios with differences.
- [ ] Any chosen numerical ratio is labeled as a hypothetical example.
- [ ] Valid alternative landmark conventions are stated and applied consistently.

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