Draw Hands and Feet: A Proportion Comparison Method

Original tasks 1, 2, 3 / complete keys

Task 1

A hand has wrist width U = 2.5 cm, total length 10 cm, and palm width 6 cm. A foot has length 15 cm and ball width 8 cm. Compute each measure in U and the hand-to-foot length ratio.

Answer: Hand length = 10 ÷ 2.5 = 4.0 U; palm width = 6 ÷ 2.5 = 2.4 U. Foot length = 15 ÷ 2.5 = 6.0 U; ball width = 8 ÷ 2.5 = 3.2 U. Hand-to-foot length ratio = 4.0 ÷ 6.0 ≈ 0.67, so the foot is about 1.5 times longer.

Reason: Divide each measured length by the shared unit U, then divide hand length by foot length to compare the two forms.

Check: Multiply each U value back by 2.5 cm and confirm it matches the original measurement; confirm 4.0 ÷ 6.0 gives the stated ratio.

Task 2

A foot is 5.5 U long and a hand is 4.0 U long. The palm length is 2.5 U. Describe a side-by-side layout on one page and state one ratio note to write beside the drawings.

Answer: Place the hand outline at 4.0 U and the foot outline at 5.5 U on the same baseline, with the foot given more horizontal space. A ratio note could read: foot length is 5.5 ÷ 4.0 = 1.375, so the foot is about 1.4 times the hand length. Palm length is 2.5 ÷ 5.5 ≈ 0.45 of the foot length.

Reason: The layout must show the shared unit and allow the longer form to fit without crowding. The ratio note uses the recorded U values.

Check: Confirm the drawn lengths are in the ratio 4.0 to 5.5 and that the note uses the same U values.

Task 3

A student draws a hand 3.8 U long and a foot 4.5 U long, but the reference table says hand 4.0 U and foot 5.5 U. Identify the error and give a correction step.

Answer: The foot is too short by 1.0 U and the hand is short by 0.2 U. Correct by extending the foot outline to 5.5 U and the hand to 4.0 U, then re-check the ratio: 4.0 ÷ 5.5 ≈ 0.73.

Reason: Compare each drawn value with the table and subtract to find the difference. The foot error is larger and changes the comparison most.

Check: Re-measure both outlines in U and confirm the differences are within 0.3 U of the table.

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Original tasks 4 / complete keys

Task 4

Using U = 3 cm, a hand palm length is 2.7 U and a foot ankle height is 2.0 U. Convert both to centimeters and state which is larger in centimeters.

Answer: Palm length = 2.7 × 3 = 8.1 cm; ankle height = 2.0 × 3 = 6.0 cm. The palm length is larger by 2.1 cm.

Reason: Multiply each U multiple by the unit value in centimeters, then subtract to compare.

Check: Divide 8.1 by 3 to recover 2.7 U and 6.0 by 3 to recover 2.0 U; confirm 8.1 − 6.0 = 2.1 cm.

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Source rubric / reflection

- [ ] A single unit U is defined and used consistently for both hand and foot.
- [ ] Measurements are recorded as decimal multiples of U with consistent units.
- [ ] A ratio table compares hand length, hand width, and palm length to foot measures.
- [ ] The side-by-side layout reflects the recorded ratios within 0.3 U.
- [ ] Baseline and midline convention is marked and used for landmark placement.
- [ ] Finger and toe shapes may vary; the rubric checks proportion and comparison, not one universal outline.
- [ ] A short written comparison states which form is longer or wider using the ratio numbers.

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