Drawing a Forearm in Perspective: Taper and Foreshortening

Original tasks 1, 2, 3 / complete keys

Task 1

Neutral pose: draw a forearm side-on with elbow width 30 mm and wrist width 21 mm. The axis is 120 mm. Compute E divided by W and state whether taper is present.

Answer: E divided by W equals 30 divided by 21, about 1.43. Taper is present because the wrist is narrower and the ratio exceeds 1.

Reason: The side-on pose keeps the axis long relative to width. The measured ratio confirms convergence toward the wrist.

Check: Measure E and W in millimeters on your drawing, divide E by W, and confirm the result is greater than 1 and close to your planned ratio.

Task 2

Foreshortened toward viewer: the wrist ellipse is 26 mm, the elbow ellipse is 22 mm, and the axis is 60 mm. Compute E divided by W. Does the drawing still show taper?

Answer: E divided by W equals 22 divided by 26, about 0.85. This does not show taper; the wrist is wider than the elbow. To show taper, the wrist must remain narrower, so adjust the wrist width downward or the elbow width upward while keeping the near-end enlargement plausible.

Reason: Foreshortening enlarges the near end, but taper requires the wrist end to stay narrower in the drawing. The ratio exposes the conflict.

Check: Re-measure both ellipses after adjustment and confirm E divided by W is greater than 1.

Task 3

Angled away: elbow ellipse 32 mm, wrist ellipse 20 mm, axis 100 mm. Compute E divided by W and the axis in elbow widths. Are these values consistent with a moderately foreshortened pose under the hypothetical example range of two to five elbow widths?

Answer: E divided by W equals 32 divided by 20, which is 1.6. The axis is 100 divided by 32, about 3.1 elbow widths. Both values are consistent with a moderately foreshortened pose under the stated example range.

Reason: The ratio confirms taper, and the axis-to-width value falls inside the example range.

Check: Measure E, W, and axis length in millimeters, compute both values, and compare with the example range.

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Original tasks 4 / complete keys

Task 4

A drawing shows elbow width 24 mm, wrist width 24 mm, and axis 80 mm. Identify the taper problem and propose one numerical fix that keeps the axis unchanged.

Answer: The widths are equal, so E divided by W equals 1 and no taper is shown. One fix is to reduce the wrist width to 18 mm, giving E divided by W of 24 divided by 18, about 1.33, while keeping the axis at 80 mm.

Reason: Taper requires the wrist end to be narrower. Changing only the wrist width preserves the axis and creates convergence.

Check: After the fix, measure E and W and confirm E divided by W is greater than 1 and the taper guides converge.

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Source rubric / reflection

- [ ] Two end ellipses are present, centered on one axis, with long axes across the limb.
- [ ] Taper guides connect the widest points and converge toward the wrist.
- [ ] The closer end ellipse is appropriately larger in foreshortened poses.
- [ ] The silhouette is smooth and the wrist end is narrower than the elbow end.
- [ ] A measured ratio E divided by W is recorded and is greater than 1.
- [ ] Alternative valid solutions are accepted if the taper converges and the measured ratio supports the claimed pose.

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