Approximate Symmetry Drawing: Compare Near-Mirror Shapes

Original tasks 1, 2 / complete keys

Task 1

A simple face is compared about a vertical axis. Eye distance from axis: left 14 mm, right 17 mm. Mouth corner distance: left 9 mm, right 9 mm. Nose tip distance: left 2 mm, right 5 mm. Calculate the absolute difference for each pair and identify the most nearly mirror-equal feature.

Answer: Eye difference is 3 mm; mouth corner difference is 0 mm; nose tip difference is 3 mm. The mouth corners are most nearly mirror-equal.

Reason: Absolute difference is larger minus smaller for each pair: 17-14=3, 9-9=0, 5-2=3. The smallest absolute difference is 0 mm at the mouth corners.

Check: Re-subtract each pair using larger minus smaller and confirm no result is negative; verify the smallest value is 0 mm.

Task 2

A shell is compared about a horizontal axis. Spiral width above axis: left 20 mm, right 24 mm. Opening height below axis: left 11 mm, right 8 mm. Ridge distance: left 6 mm, right 6 mm. Which feature has the largest absolute difference, and what should the redraw show?

Answer: Spiral width difference is 4 mm; opening height difference is 3 mm; ridge difference is 0 mm. The spiral width has the largest absolute difference, so the redraw should show the right spiral about 4 mm wider than the left.

Reason: Compute 24-20=4, 11-8=3, and 6-6=0. The largest is 4 mm, so the redraw preserves that right-side widening.

Check: Compare the three absolute differences and confirm the largest is 4 mm; re-measure the redrawn spiral widths to confirm a 4 mm difference within tolerance.

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Original tasks 3, 4 / complete keys

Task 3

A leaf is compared about a vertical axis. Edge point A: left 12 mm, right 15 mm. Edge point B: left 9 mm, right 9 mm. Edge point C: left 7 mm, right 10 mm. If the redraw tolerance is 1 mm, which feature pairs are acceptable when redrawn exactly as logged?

Answer: All three pairs are acceptable because the redraw uses the logged values, so each redrawn absolute difference matches the log exactly: 3 mm, 0 mm, and 3 mm. The tolerance applies to deviation from the log, not to the size of the original difference.

Reason: The tolerance is a limit on how far the redraw may depart from the recorded difference. Reproducing the logged values gives zero deviation, which is within 1 mm for every pair.

Check: For each pair, subtract the redrawn difference from the logged difference; confirm the result is 0 mm, which is less than or equal to 1 mm.

Task 4

A face is compared about a vertical axis. Ear distance: left 16 mm, right 19 mm. Chin width: left 13 mm, right 13 mm. Eyebrow height from baseline to midline: left 22 mm, right 25 mm. List the absolute differences and state one valid alternative drawing choice that still satisfies the rubric.

Answer: Ear difference is 3 mm; chin difference is 0 mm; eyebrow difference is 3 mm. A valid alternative is to draw the eyebrows with a different line style or curve, provided the midline heights remain about 22 mm and 25 mm so the 3 mm difference is preserved.

Reason: Absolute differences are 19-16=3, 13-13=0, and 25-22=3. The rubric allows style variation when measured relationships are kept, so changing the eyebrow shape is acceptable if the midline heights are maintained.

Check: Re-measure the redrawn eyebrow midline heights from baseline to midline and confirm the difference is about 3 mm; confirm the ear and chin differences match the log within tolerance.

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Source rubric / reflection

- [ ] Comparison axis is straight and clearly labelled left and right.
- [ ] At least three corresponding feature pairs are measured in consistent units.
- [ ] Difference log uses absolute difference, larger minus smaller, with no negative values.
- [ ] Redraw preserves recorded left-right differences within the stated tolerance.
- [ ] Midline-height convention is applied to rounded features, allowing valid style alternatives.
- [ ] Work is checkable by re-measurement against the log.

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