Draw Seashells with Spiral and Rib Construction

Original tasks 1 / complete keys

Task 1

Draw a spiral shell with three coil loops and five ribs. Use a cone outline 10 cm long and 5 cm wide at the base. Mark rib intervals of 6 mm at the widest growth line and 3 mm near the tip.

Answer: Cone outline with axis. Three loops touching but not crossing. Two growth lines marked. Five rib marks at 6 mm on the wide line, projected to 3 mm on the upper line. Ribs drawn as curved arcs. Light shadow under crests.

Reason: Three loops keep the spiral simple. Narrowing intervals from 6 mm to 3 mm prevents crowding. Projecting marks ensures alignment.

Check: Count three loops and five ribs. Measure intervals: 6 mm on wide line, 3 mm on upper line. Check each rib meets a mark on both lines.

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Original tasks 2 / complete keys

Task 2

Draw a rib-dominated shell with no visible spiral coil. Use a rounded outline 8 cm wide and 6 cm tall. Mark a center growth line running horizontally across the middle of the shell and two curved edge growth lines that follow the shell outline, one near the top edge and one near the bottom edge. Place eight rib marks along the center line at 8 mm spacing: seven intervals totaling 56 mm, centered within the 80 mm width, so the first mark is 12 mm from the left edge and the last is 12 mm from the right edge. On each curved edge guide, transfer the same eight normalized positions from left to right (15%, 25%, 35%, 45%, 55%, 65%, 75%, and 85% of that guide’s total arc length). Keep their order; the 12 mm margin applies only to the straight centerline, and the curved marks are not evenly spaced by 8 mm. Draw each rib as a curved arc bowing outward, with heavier line weight at the crest.

Answer: Rounded outline 8 cm wide and 6 cm tall. Horizontal center growth line and two curved edge growth lines following the shell outline marked. Eight rib marks placed along the center line at 8 mm intervals (seven intervals, 56 mm total), centered so the first and last marks sit 12 mm from the left and right edges. On each curved edge guide, place marks at the same normalized arc-length positions from left to right: 15%, 25%, 35%, 45%, 55%, 65%, 75%, and 85%. Preserve order; do not copy the straight-line 12 mm margin or claim equal 8 mm spacing on the curves. Ribs drawn as arcs bowing outward, heavier at crests.

Reason: Without a coil, ribs carry the form. The straight centerline uses equal 8 mm intervals. Curved guides use the same normalized left-to-right fractions, so corresponding marks remain ordered without treating curved distance as horizontal distance. Curved arcs prevent a flat look, and heavier crest lines suggest rib height.

Check: Count eight ribs. Measure spacing on the horizontal center line: 8 mm between adjacent marks (seven intervals, 56 mm total), with 12 mm margins at each end of the 80 mm width. On each curved edge guide, check that marks remain in left-to-right order at normalized arc-length fractions 15%, 25%, 35%, 45%, 55%, 65%, 75%, and 85%. The 12 mm margins and equal 8 mm intervals apply only to the straight centerline. Check that each rib is a curved arc bowing outward, not a straight vertical line.

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Original tasks 3, 4 / complete keys

Task 3

Draw a spiral shell with four loops and seven ribs. Use a cone outline 14 cm long and 7 cm wide. Mark rib intervals of 9 mm at the widest line and 4.5 mm near the tip. Add a shadow from the upper left.

Answer: Cone outline with axis. Four loops. Two growth lines. Seven rib marks at 9 mm and 4.5 mm. Curved ribs aligned. Shadow along lower right edge and under crests.

Reason: Four loops and seven ribs balance detail and clarity. Halving the interval near the tip maintains proportion. Shadow from upper left creates consistent depth.

Check: Count four loops and seven ribs. Measure 9 mm and 4.5 mm intervals. Check shadow direction is consistent.

Task 4

Draw a shell combining spiral and ribs: three loops, six ribs, cone outline 12 cm long and 6 cm wide. Use rib intervals of 7 mm at the wide line and 3.5 mm near the tip. Vary one rib spacing slightly and explain why.

Answer: Cone outline. Three loops. Six ribs with guide intervals of 7 mm at the wide line and 3.5 mm near the tip; one rib drawn 1 mm offset from its guide mark, making the two adjacent intervals 6 mm and 8 mm while the others remain 7 mm. Explanation: slight variation avoids mechanical repetition and is allowed by the rubric.

Reason: Combining systems requires ribs to follow the coil. A small variation tests understanding of alignment versus rigid spacing.

Check: Count three loops and six ribs. On the wide line, confirm the guide marks are at 7 mm intervals (five intervals = 35 mm total); then confirm one rib is drawn 1 mm offset from its guide mark, so the adjacent intervals become 6 mm and 8 mm while the remaining intervals stay at 7 mm. On the tip line, confirm guide marks at 3.5 mm intervals and that the offset rib remains within 1 mm of its guide mark. Check that all ribs remain curved arcs aligned across both growth lines.

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Source rubric / reflection

- [ ] Spiral coil follows a cone taper with three to five loops.
- [ ] Growth-line guides are present and used for rib alignment.
- [ ] Ribs are curved arcs, not straight lines, and align across growth lines.
- [ ] Rib spacing narrows toward the tip using a stated hypothetical interval.
- [ ] Line weight distinguishes rib crests from valleys.
- [ ] Shadow is consistent with a single light source.
- [ ] Construction lines are erased or faint.
- [ ] Valid alternatives: loop count, rib count, and slight spacing variation are acceptable if alignment and taper are maintained.

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