Spiral Swirl Line Drawing: Direction Arrows and Control Practice

Original tasks 1, 2 / complete keys

Task 1

Draw a counterclockwise loose spiral inside a 5 cm circle guide. Use gaps about 1 cm wide. Add three arrows. Measure the largest and smallest gaps and state whether gap evenness passes.

Answer: A counterclockwise spiral with gaps near 1 cm. Example measurement: largest gap 1.3 cm, smallest gap 0.9 cm. Twice the smallest gap is 1.8 cm, and 1.3 cm is less than 1.8 cm, so gap evenness passes. All arrows point counterclockwise.

Reason: Loose spacing means wider gaps. The check compares the largest gap to twice the smallest gap. If the largest is less than twice the smallest, the spacing is acceptably even.

Check: Measure three gaps with a ruler. Confirm every arrowhead follows the counterclockwise curve. Compare the largest gap to twice the smallest gap; the spiral passes if the largest is less than twice the smallest.

Task 2

Draw an alternating spiral that starts clockwise for one full turn, then switches to counterclockwise for one full turn, then back to clockwise. Place an arrow at each turn. Label the spiral.

Answer: A spiral with three marked turns. First turn arrows point clockwise, second turn arrows point counterclockwise, third turn arrows point clockwise. Label: alternating. Direction consistency passes because each arrow matches its turn.

Reason: Alternating spirals require a direction change at each full turn. Arrows must flip at the turn points, not mid-loop. The label confirms the intended pattern.

Check: Trace each turn with a finger. Confirm the arrow direction flips exactly at each turn point. Check that the label says alternating.

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Original tasks 3, 4 / complete keys

Task 3

Draw two tight spirals side by side: one clockwise and one counterclockwise. Use the same center dot spacing and gap width. Add two arrows to each. Compare the gap evenness of both.

Answer: Two tight spirals with matching gap widths. Example: clockwise spiral largest gap 0.6 cm, smallest 0.4 cm; counterclockwise spiral largest 0.7 cm, smallest 0.5 cm. Both pass because each largest gap is less than twice its smallest gap. Arrows match each rotation.

Reason: Drawing both directions tests symmetry of control. The check is the same for each spiral: the largest gap must be less than twice the smallest gap. Matching gap widths show consistent pressure.

Check: Measure gaps in both spirals. Confirm arrows point in opposite rotations. Verify each spiral passes the gap evenness rule independently by checking that its largest gap is less than twice its smallest gap.

Task 4

Draw a spiral that starts at the outside and winds inward, counterclockwise, with loose spacing. Add three arrows pointing inward along the path. Measure the total number of full turns and the largest gap.

Answer: An inward counterclockwise spiral with three inward-pointing arrows. Example: three full turns and a largest gap of 1.2 cm. Arrows follow the inward path. Direction consistency passes because all arrows point counterclockwise inward.

Reason: Starting outside and winding inward is a valid alternative. Arrows must point along the inward path, not outward. Counting full turns confirms the spiral is complete.

Check: Count full turns by tracing from the outer end to the center. Confirm each arrow points inward and counterclockwise. Measure the largest and smallest gaps and confirm the largest is less than twice the smallest.

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Source rubric / reflection

- [ ] Direction consistency: all arrows follow the same rotation (3 points).
- [ ] Gap evenness: largest gap is less than twice the smallest gap (3 points).
- [ ] Line continuity: no unintended lifts or breaks (3 points).
- [ ] Labeling: spiral type and direction are clearly marked (1 point).
- [ ] Valid alternatives: inward or outward start, clockwise or counterclockwise, and any letter style are accepted if arrows match the chosen path.

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