Detailed Tree Drawing: Bark Cracks, Twig Networks, and Leaf Layering

Original tasks 1, 2, 3 / complete keys

Task 1

A trunk is 16 cm tall and divided into four equal bands. Base width is 4 cm and top width is 2 cm. Compute the per-band reduction and list the width at each boundary from ground to top.

Answer: Per-band reduction is (4 minus 2) divided by 4 equals 0.5 cm. Widths from ground upward are 4.0 cm, 3.5 cm, 3.0 cm, 2.5 cm, and 2.0 cm.

Reason: Subtract top width from base width, divide by the number of bands, then subtract the reduction cumulatively at each boundary.

Check: Measure each boundary width on your drawing with a ruler and compare to the listed values; differences should fall within your stated tolerance.

Task 2

You plan 4 primary limbs, 3 secondary branches per primary, and 4 fine twigs per secondary. Compute the total fine twig count. Then state one visual test to confirm the network is traceable.

Answer: Total fine twigs are 4 times 3 times 4 equals 48. Visual test: trace three fine twigs back to the trunk without ambiguity.

Reason: Multiply the counts through the hierarchy: primary times secondary times fine. Traceability is tested by following a twig to its parent and onward to the trunk.

Check: Count drawn fine twigs and compare to 48; perform the trace test on three twigs and record any ambiguous attachment.

Task 3

In a 6 cm by 6 cm bark practice box, you draw five major cracks spaced 1.2 cm apart vertically. Compute the total vertical span used by the spacing between the first and fifth crack centers, and state the taper rule for each crack.

Answer: There are four intervals between five cracks, so the span is 4 times 1.2 cm equals 4.8 cm. Taper rule: each crack is widest at its center, for example 2 mm, and tapers to 0 mm at both ends.

Reason: The number of intervals is one less than the number of cracks. The taper rule is stated as a measurable width at center and zero at ends.

Check: Measure the distance between first and fifth crack centers and compare to 4.8 cm; measure center width of each crack and confirm taper to zero at ends.

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Original tasks 4 / complete keys

Task 4

A crown is divided into three tonal zones with hypothetical allocations of 40 percent dark interior, 35 percent mid-tone, and 25 percent light outer edge. If the crown covers 20 grid squares, compute the square count for each zone. Then state the squint test for layer order.

Answer: Dark interior is 0.40 times 20 equals 8 squares; mid-tone is 0.35 times 20 equals 7 squares; light outer edge is 0.25 times 20 equals 5 squares. Squint test: dark should appear behind mid-tone, and mid-tone behind light, with no light cluster fully surrounded by dark without a mid-tone bridge.

Reason: Convert percentages to decimals and multiply by total grid squares. The squint test checks perceived depth order by reducing detail.

Check: Count grid squares assigned to each zone and compare to 8, 7, and 5; squint at the drawing and verify the layer order, adding a mid-tone bridge where needed.

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Source rubric / reflection

- [ ] Trunk axis is vertical and taper widths at band boundaries match the stated plan within the chosen tolerance.
- [ ] Primary limbs, secondary branches, and fine twigs form a traceable hierarchy with child widths about half parent widths.
- [ ] Bark cracks follow trunk curvature, taper to zero at both ends, and do not cross trunk edges or branch attachments.
- [ ] Leaf layers show dark interior, mid-tone middle, and light outer edge with overlap increasing toward the interior.
- [ ] Labels, if any, are legible and placed without obscuring the drawing; x-height convention is stated and applied consistently.
- [ ] All numerical values are labeled as hypothetical examples or measured from the actual paper and tools.

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