Draw and Compare Taproot, Fibrous, and Tuberous Root Systems

Original tasks 1, 2 / complete keys

Task 1

Draw a fibrous panel on a 100 mm baseline. Use a scale where one x-height equals 8 mm (hypothetical). Draw eight roots fanning from the crown, each between 15 mm and 25 mm long. Label crown, fibrous roots, fine branches, and root tips.

Answer: A fibrous panel with eight roots of similar thickness near the crown, lengths between 15 mm and 25 mm, small forks near tips, and four labels with leader lines touching the named parts.

Reason: Eight roots satisfy the six-to-ten convention; the length range keeps no root more than about twice the shortest; labels match the listed parts.

Check: Measure each root length and confirm it lies between 15 mm and 25 mm; count eight roots; point to each label and confirm its leader touches the named part.

Task 2

Draw a tuberous panel on a 90 mm baseline. Draw a short main root 20 mm long, widen one section into a swelling 12 mm wide, and add three thin branch roots 10 mm long from the swelling. Label crown, swollen root, branch roots, and root tip.

Answer: A tuberous panel with a smooth centerline through the swelling, one widened section 12 mm wide, three thin branch roots from the swelling, and four labels with leader lines.

Reason: The swelling is shown by widening, not bending; branch roots start at the swollen section; labels match the listed parts.

Check: Confirm the centerline is smooth through the swelling; measure the swelling width as 12 mm; count three branch roots; check each label leader.

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Original tasks 3, 4 / complete keys

Task 3

Draw a taproot panel on a 110 mm baseline. Draw a main root 40 mm long and six branch roots, three per side, each 15 mm long. Then write one comparison-table row stating the main structure and whether storage swelling is shown.

Answer: A taproot panel with one main root 40 mm long, six branch roots 15 mm long that do not cross the main root, and a table row: main structure is one main root with branch roots; storage swelling is not shown.

Reason: The main root is longer than branch roots; branch roots join without crossing; the table row matches the drawing.

Check: Measure main root and branch roots; check no branch crosses the main root; read the table row and point to the matching labeled parts.

Task 4

Draw all three panels on one page using a single scale where one x-height equals 10 mm (hypothetical). Use baselines of 100 mm each. For each panel, write one sentence explaining how its branching differs from the other two.

Answer: Three panels at the same scale with 100 mm baselines. Taproot sentence: one main root with branch roots. Fibrous sentence: many similar roots with fine branching. Tuberous sentence: swollen sections with branch roots from the swellings.

Reason: A single scale makes the comparison fair; each sentence names the branching pattern that distinguishes that panel.

Check: Confirm all baselines are 100 mm and the scale note is the same; read each sentence and point to the labeled parts that support it.

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Source rubric / reflection

- [ ] Baseline and crown are present in all three panels.
- [ ] Taproot panel shows one main root and branch roots that do not cross it.
- [ ] Fibrous panel shows six to ten similar-sized roots with fine branching.
- [ ] Tuberous panel shows smooth swelling and branch roots from swollen sections.
- [ ] Labels match the listed parts and leader lines touch the named parts.
- [ ] Comparison table entries match labeled parts in each panel.
- [ ] One scale is recorded and applied to all panels.
- [ ] Valid alternatives are accepted when the convention and table remain consistent.

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