Draw the Eiffel Tower with Grid Squares and Proportion Guides

Original tasks 1, 2, 3 / complete keys

Task 1

Using H = 12 squares, tier tops at 0.30H, 0.60H, and 0.85H, tier widths 0.30H, 0.18H, and 0.08H, and W = 0.45H, compute all values in squares, rounding to the nearest half square. Describe the splay offset.

Answer: Tier tops: 3.6 rounds to 3.5; 7.2 rounds to 7; 10.2 rounds to 10. Tier widths: 3.6 rounds to 3.5; 2.16 rounds to 2; 0.96 rounds to 1. W = 5.4 rounds to 5.5. Splay offset per side = (5.5 minus 3.5) divided by 2 = 1 square.

Reason: Multiply each fraction by H, round to the nearest half square, then subtract the first-tier width from W and divide by two for the per-side offset.

Check: Recompute each product and confirm the base is wider than the first tier by twice the offset.

Task 2

A drawing uses H = 24 squares and W = 10 squares. The first-tier width is 7 squares. Compute the splay offset per side and state whether the base is wider than the first tier.

Answer: Offset = (10 minus 7) divided by 2 = 1.5 squares per side. The base is wider than the first tier by 3 squares total, so the splay is valid.

Reason: The offset is half the difference between base width and first-tier width. A positive offset means the legs splay outward.

Check: Add twice the offset to the first-tier width and confirm it equals W.

Task 3

On a grid with H = 20 squares, a student places tier guides at 5, 11, and 16 squares above ground. Compare these to the target fractions 0.30H, 0.60H, and 0.85H and state the differences in squares.

Answer: Targets: 6, 12, and 17 squares. Differences: 5 is 1 square low; 11 is 1 square low; 16 is 1 square low. All three guides are one square below target.

Reason: Multiply each fraction by 20 to get the target heights, then subtract the student's values.

Check: Recompute 0.30 times 20, 0.60 times 20, and 0.85 times 20, and confirm each difference is 1 square.

Draw the Eiffel Tower with Grid Squares and Proportion Guides

Original tasks 4 / complete keys

Task 4

A student draws a tower with H = 18 squares, first-tier width 5 squares, and base width 5 squares. Identify the proportion error and give a corrected base width using W = 0.45H rounded to the nearest half square.

Answer: The error is zero splay: base width equals first-tier width, so the legs do not splay. Corrected W = 0.45 times 18 = 8.1, rounds to 8 squares. The new offset per side is (8 minus 5) divided by 2 = 1.5 squares.

Reason: A valid splay requires the base to be wider than the first tier. Recompute W from the fraction and then find the offset.

Check: Confirm the corrected base is wider than the first tier and that twice the offset plus first-tier width equals W.

Draw the Eiffel Tower with Grid Squares and Proportion Guides

Source rubric / reflection

- [ ] Grid is square and light, with a clear centre line and ground line.
- [ ] Envelope height H and base width W are labelled and consistent in one unit.
- [ ] Tier guide heights match the chosen fractions of H within half a square.
- [ ] Tier widths are centred and match the chosen fractions within half a square.
- [ ] Leg splay offset is computed and drawn symmetrically on both sides.
- [ ] Silhouette reads as the Eiffel Tower and construction lines are clean or erased.
- [ ] Valid alternatives are accepted when proportions are internally consistent and checked.

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