Layered Cake Drawing: Tier Heights and Frosting Bands

Original tasks 1, 2, 3 / complete keys

Task 1

A three-tier cake uses a 4:2:1 ratio with a unit of 2 cm. State the height of each tier and the total cake height.

Answer: Bottom = 8 cm, middle = 4 cm, top = 2 cm, total = 14 cm.

Reason: Multiply each ratio part by the unit: 4×2=8, 2×2=4, 1×2=2. Add: 8+4+2=14 cm.

Check: Re-add the tier heights and confirm the sum equals the total; confirm each height is a multiple of the unit.

Task 2

A frosting band is drawn at 5 cm from the baseline on a tier that is 10 cm tall. A second band is placed midway between the first band and the top of the tier. At what height is the second band?

Answer: 7.5 cm from the baseline.

Reason: Midway between 5 cm and 10 cm is (5+10)/2 = 7.5 cm.

Check: Confirm the second band is equidistant from 5 cm and 10 cm: 7.5−5=2.5 and 10−7.5=2.5.

Task 3

A bottom tier is 12 cm wide. Each higher tier is 2 cm narrower. State the widths of the middle and top tiers for a three-tier cake.

Answer: Middle = 10 cm, top = 8 cm.

Reason: Subtract 2 cm per tier: 12−2=10, 10−2=8.

Check: Confirm each width is smaller than the one below by exactly 2 cm.

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Original tasks 4 / complete keys

Task 4

You plan five frosting bands on a cake that is 15 cm tall. Bands are at 3 cm, 6 cm, 9 cm, 12 cm, and 15 cm. Are the bands evenly spaced? If not, state a corrected set of five evenly spaced heights from 3 cm to 15 cm inclusive.

Answer: The given bands are evenly spaced at 3 cm intervals. A corrected set is not needed; if starting at 3 cm and ending at 15 cm with five bands, the spacing is (15−3)/4 = 3 cm, giving 3, 6, 9, 12, 15 cm.

Reason: Even spacing means equal differences between consecutive heights. The differences are all 3 cm, so the set is even. The formula (last−first)/(count−1) confirms the spacing.

Check: Subtract consecutive heights and confirm all differences are equal.

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Source rubric / reflection

- [ ] Tier heights follow a stated ratio and are measurable with a ruler.
- [ ] Each higher tier is narrower than the tier below.
- [ ] Frosting bands are drawn as ellipses with a clear front and back curve.
- [ ] Band heights are marked from the baseline and spacing is even where intended.
- [ ] Decorations are evenly spaced along band curves; shape and style may vary.
- [ ] Construction lines are erased and final outlines are clear.

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