Draw a Law Balance Scale: Beam, Pans, and Pillar

Original tasks 1, 2, 3, 4 / complete keys

Task 1

A drawing has a beam 10 cm long centered on a pillar. Each pan is 2 cm wide and centered under a beam end. Calculate the total width from left pan edge to right pan edge.

Answer: Total width = 10 cm + 1 cm + 1 cm = 12 cm.

Reason: Each pan extends half its width (1 cm) beyond its beam end. Adding both overhangs to the beam length gives 12 cm.

Check: Measure the drawn width and confirm each pan overhang is 1 cm.

Task 2

A pillar is 8 cm tall from baseline to beam line. The suspension lines are 2 cm long. What is the distance from the baseline to the pan-hang line?

Answer: Distance = 8 cm + 2 cm = 10 cm.

Reason: The pan-hang line is below the beam line by the suspension length, so add pillar height and suspension length.

Check: Measure from baseline to pan-hang line and compare to 10 cm.

Task 3

A beam is 14 cm long. You want each pan to be 4 cm wide and centered under a beam end. How far does each pan extend beyond its beam end, and what is the total width?

Answer: Each pan extends 2 cm beyond its beam end; total width = 14 cm + 2 cm + 2 cm = 18 cm.

Reason: Half of 4 cm is 2 cm, so each pan overhangs by 2 cm. Add both overhangs to the beam length.

Check: Measure each overhang as 2 cm and total width as 18 cm.

Task 4

In a practice box, you redraw the scale at half the example dimensions: pillar height 5 cm, beam length 6 cm, suspension lines 1.5 cm, pan width 1.5 cm. Calculate the total width from left pan edge to right pan edge.

Answer: Each pan overhang = 0.75 cm; total width = 6 cm + 0.75 cm + 0.75 cm = 7.5 cm.

Reason: Half of the pan width is 0.75 cm. Adding both overhangs to the beam length gives 7.5 cm.

Check: Measure the practice drawing width and confirm each overhang is 0.75 cm.

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Source rubric / reflection

- [ ] Beam is level within the drawn guide; both beam ends are equidistant from the baseline.
- [ ] Pillar is centered on the beam and vertical; base and cap are symmetric about the center line.
- [ ] Suspension lines are equal in length and vertical.
- [ ] Pans are equal in width and depth and hang at the same height.
- [ ] Line style is consistent; construction guides are removed or hidden.
- [ ] Practice box contains a smaller redrawn scale using the same proportions.

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