Draw an Antique Balance Scale with Labeled Parts

Original tasks 1, 2 / complete keys

Task 1

On a 12 cm by 18 cm drawing area, draw a scale with a 7 cm base, a 5 cm column, and a 9 cm beam. Place the pointer below the beam centre. Measure from the beam centre to each pan and record both distances. Label beam, pan, pointer, and base.

Answer: A complete sketch with a 7 cm base, 5 cm column, 9 cm beam, pointer below centre, two matched pans, four correct labels, and two recorded pan distances.

Reason: The beam is longer than the base, the pointer is below the centre, and the labels match the parts. Recording both distances makes symmetry checkable.

Check: Measure the base, column, and beam with a ruler. Confirm the pointer is below the beam centre. Compare the two pan distances and note the difference in centimetres.

Task 2

A sketch has a 10 cm beam, an 8 cm base, and pans at 4.0 cm and 5.5 cm from the beam centre. The pointer is below the beam. State whether the symmetry passes a hypothetical 0.5 cm tolerance and explain what to adjust.

Answer: The difference is 1.5 cm, so it does not pass the 0.5 cm tolerance. Move the pans so the two distances are closer, for example 4.5 cm and 5.0 cm, and re-measure.

Reason: Subtract the smaller distance from the larger: 5.5 minus 4.0 equals 1.5 cm. Since 1.5 is greater than 0.5, the sketch is outside the chosen tolerance.

Check: Re-measure both pan distances after adjustment and subtract again. Confirm the new difference is 0.5 cm or less.

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Original tasks 3, 4 / complete keys

Task 3

Draw a scale with a tipped beam: the left pan is lower than the right pan. Keep the base, column, and pointer. Label all four parts and write one short note explaining that the tip is intentional.

Answer: A sketch with a slanted beam, one pan lower than the other, a pointer below the beam centre, four correct labels, and a note such as 'tipped scale shown intentionally'.

Reason: A tipped beam is acceptable when it is deliberate and noted. The pointer still hangs below the centre, and the labels remain clear.

Check: Confirm the note is present, the pointer is below the beam centre, and each label points to the correct part. Check that the lower pan is clearly lower than the other.

Task 4

Using a hypothetical 0.5 cm tolerance, check a drawing where the left pan is 3.7 cm and the right pan is 4.1 cm from the beam centre. State the difference, whether it passes, and one label check you would perform.

Answer: The difference is 0.4 cm, so it passes the 0.5 cm tolerance. A label check is to trace each leader line from its label box to the named part and confirm no line crosses another.

Reason: Subtract 3.7 from 4.1 to get 0.4 cm. Since 0.4 is less than 0.5, the symmetry passes. Label checks confirm the drawing is correctly annotated.

Check: Re-subtract the two recorded distances and confirm the result is 0.5 cm or less. Then inspect each leader line for correct endpoint and no crossing.

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Source rubric / reflection

- [ ] Base, column, beam, pointer, and two pans are all present and recognizable.
- [ ] Beam is longer than the base width and centred on the column.
- [ ] Pointer hangs below the beam centre and points downward.
- [ ] Two pans are matched in size and height, or a tipped scale is clearly noted.
- [ ] Four labels are readable, correctly placed, and connected by leader lines that do not cross.
- [ ] Measurements from beam centre to each pan are recorded in centimetres and compared.
- [ ] Handwriting uses a consistent style with visible x-height from baseline to midline.

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