# Astrobot Drawing: Head and Limb Placement Construction

Original tasks 1, 2, 3 / complete keys

Task 1

On a 24 cm by 30 cm paper with a 2 cm border and a 1.5 cm unit, find the construction width and height after the border.

Answer: Construction width is 24 minus 4 equals 20 cm. Construction height is 30 minus 4 equals 26 cm.

Reason: The border removes 2 cm from each side, so subtract 4 cm from both dimensions. Keep units in centimeters.

Check: Measure the bordered area with a ruler and confirm 20 cm by 26 cm.

Task 2

A head zone is three units wide and three units tall. Its top is two units below the top border. With a one-unit neck gap, how far below the top border is the torso top?

Answer: The torso top is 6 units below the top border.

Reason: Head zone top is 2 units down. Head zone height is 3 units, so its bottom is 5 units down. Add the 1-unit neck gap to get 6 units down.

Check: Add 2 plus 3 plus 1 and compare with the measured distance on the page.

Task 3

A torso is four units wide. Shoulder joints are one unit inward from each top corner. How far apart are the two shoulder joints?

Answer: The shoulder joints are 2 units apart.

Reason: Each joint is 1 unit inward from a corner, so the distance between them is 4 minus 1 minus 1 equals 2 units.

Check: Measure between the two joint marks and confirm 2 units.

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Original tasks 4 / complete keys

Task 4

An arm has an upper arm of three units and a forearm of three units. A leg has a thigh of four units and a shin of four units. If the left arm measures 6.5 units total and the right arm measures 6 units total, is the difference within half a unit?

Answer: Yes, the difference is 0.5 units, which is within the half-unit allowance.

Reason: Subtract 6 from 6.5 to get 0.5. The check allows differences up to half a unit, so this passes.

Check: Measure both arms with the same ruler and subtract the smaller total from the larger.

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Source rubric / reflection

- [ ] Head is placed inside a centered three-unit zone with a visible margin.
- [ ] One unit is defined from baseline to midline and used consistently.
- [ ] Torso is centered and sized four units by five units with a one-unit neck gap.
- [ ] Shoulder and hip joints are marked one unit inward from torso corners.
- [ ] Limb segments match planned lengths within half a unit on both sides.
- [ ] Construction lines are light and placement checks are recorded.
- [ ] Valid alternatives in head shape or limb style are accepted if placement checks pass.

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