Draw a Simple Old Sailing Ship: Hull and Rigging Construction

Original tasks 1, 2, 3 / complete keys

Task 1

With L = 20 cm and H = 4 cm, mark the baseline, deck line, and midline. State the coordinates of bow top, stern top, and midship bulge.

Answer: Baseline 0 to 20 cm; deck line at 4 cm; midline at 10 cm. Bow top (0,4), stern top (20,4), midship bulge (10,2).

Reason: Use the definitions: bow at x=0, stern at x=L, midline at L/2, deck line at y=H, bulge at H/2.

Check: Measure the distance from midline to bow top and to stern top; both should be 10 cm within 0.5 cm.

Task 2

Place three masts on a deck line of length 24 cm at equal intervals. State their x-positions and the spacing.

Answer: Foremast at 6 cm, mainmast at 12 cm, mizzenmast at 18 cm; spacing is 6 cm.

Reason: Equal intervals divide L into four parts: L/4, L/2, 3L/4.

Check: Subtract adjacent positions: 12-6=6 and 18-12=6; both equal L/4.

Task 3

Given mast tops F(5,8), M(10,10), Z(15,7) and bow top B(0,4), stern top S(20,4), list four rigging lines with endpoints and count them. Use the connections: a mast top to the bow, adjacent mast tops to each other, and a mast top to the stern.

Answer: Lines: F to B; M to F; M to Z; Z to S. Count = 4.

Reason: Each line must connect two labeled points. The four connections are: foremast top to bow top; mainmast top to foremast top; mainmast top to mizzenmast top; mizzenmast top to stern top.

Check: Verify each line has two endpoints from the set {F,M,Z,B,S} and count the lines.

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Original tasks 4 / complete keys

Task 4

A hull drawing has a midline at 10 cm. At the same height, the outermost drawn bow curve is 9.5 cm from the midline and the outermost drawn stern curve is 10.5 cm from the midline. Is the hull symmetric within 0.5 cm? State the fix.

Answer: No; the difference is 1.0 cm, which exceeds 0.5 cm. Adjust the bow curve outward or the stern curve inward, keeping the midline fixed.

Reason: Compare the two measured distances from the midline to the drawn curve extremes: 10.5 - 9.5 = 1.0 cm. Since 1.0 cm is greater than 0.5 cm, the hull is not symmetric within the tolerance.

Check: Re-measure both distances from the midline to the outermost drawn curves at the same height after adjustment; the difference should be 0.5 cm or less.

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Source rubric / reflection

- [ ] Hull is a closed shape between baseline and deck line.
- [ ] Mast positions are at L/4, L/2, and 3L/4 within 0.5 cm.
- [ ] Each rigging line connects two labeled endpoints.
- [ ] Units and convention are stated on the page.
- [ ] No crew, harbor, or modern vessel elements are included.

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