Scorpio Drawing: Glyph Strokes and Constellation Layout

Original tasks 1, 2 / complete keys

Task 1

A glyph panel is 80 mm wide and 80 mm high. The x-height is 20 mm. You choose a stem height of 45 mm, a hook extension of 30 mm, and a crossbar length of 12 mm. Check each value against the convention ranges and state whether the glyph is valid.

Answer: Stem height 45 mm is valid because 1.5 times 20 mm is 30 mm and 2.5 times 20 mm is 50 mm. Hook extension 30 mm is valid because half of 45 mm is 22.5 mm and full stem height is 45 mm. Crossbar length 12 mm is valid because 0.5 times 20 mm is 10 mm and 1.0 times 20 mm is 20 mm. The glyph is valid if it stays inside the panel with a 5 mm border.

Reason: Compare each measurement to the stated range. Use simple multiplication and division with the x-height and stem height. The border check ensures the drawing fits the panel.

Check: Recalculate the ranges: 1.5 x 20 = 30, 2.5 x 20 = 50, 0.5 x 45 = 22.5, 1.0 x 45 = 45, 0.5 x 20 = 10, 1.0 x 20 = 20. Confirm each chosen value lies within its range.

Task 2

In a constellation panel 120 mm wide and 80 mm high, place stars A at (10 mm, 10 mm), B at (50 mm, 10 mm), C at (50 mm, 40 mm), D at (30 mm, 70 mm), and E at (10 mm, 70 mm), measuring from the bottom left corner. Connect A-B, B-C, C-D, and D-E. Check whether all stars are inside a 5 mm border and whether any lines cross.

Answer: All stars are inside the 5 mm border because each coordinate is at least 10 mm from an edge and the panel is 120 mm by 80 mm. The lines A-B, B-C, C-D, and D-E form a chain without crossing. The layout is valid.

Reason: A 5 mm border means x coordinates must be between 5 mm and 115 mm, and y coordinates between 5 mm and 75 mm. All given coordinates satisfy this. The chain order ensures no crossing because each line connects consecutive stars.

Check: List the coordinates and compare to the border limits. Sketch the chain and visually confirm that no line intersects another except at shared star endpoints.

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Original tasks 3, 4 / complete keys

Task 3

A practice panel has a baseline and midline 18 mm apart. You draw a glyph with stem height 36 mm and hook extension 20 mm. Later you measure the crossbar length as 8 mm. Check whether the glyph meets the convention ranges and state one adjustment if needed.

Answer: X-height is 18 mm. Stem height 36 mm is valid because 1.5 x 18 = 27 mm and 2.5 x 18 = 45 mm. Hook extension 20 mm is valid because half of 36 mm is 18 mm and full stem height is 36 mm. Crossbar length 8 mm is not valid because the minimum is 0.5 x 18 = 9 mm. Increase the crossbar to at least 9 mm, for example 10 mm.

Reason: Use the x-height to compute the crossbar range. The measured 8 mm is below the minimum, so a small adjustment is needed. The other measurements already fit.

Check: Recalculate 0.5 x 18 = 9 and 1.0 x 18 = 18. Confirm 8 mm is outside the range and that the suggested 10 mm is inside.

Task 4

You want to draw a constellation chain with five stars in a panel 100 mm wide and 60 mm high. You choose star distances A-B = 25 mm, B-C = 30 mm, C-D = 20 mm, and D-E = 35 mm. Check whether each distance is within the example range of 10 mm to 40 mm and whether the total chain length could fit if drawn in a straight line.

Answer: All four distances are within 10 mm to 40 mm. The total chain length is 25 + 30 + 20 + 35 = 110 mm. A straight-line chain of 110 mm cannot fit inside a 100 mm wide panel, so the chain must turn or the distances must be reduced. The individual distances are valid, but the layout needs adjustment to fit the panel.

Reason: Add the distances to find the total. Compare the total to the panel width. Since 110 mm is greater than 100 mm, a straight chain would exceed the panel. Turning the chain or reducing distances solves the fit problem.

Check: Re-add the distances: 25 + 30 = 55, 55 + 20 = 75, 75 + 35 = 110. Compare 110 mm to the 100 mm panel width. Confirm that each individual distance is between 10 mm and 40 mm.

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Source rubric / reflection

- [ ] Glyph strokes are drawn in the order stem, hook, crossbar.
- [ ] Glyph stem height is between 1.5 and 2.5 times the x-height.
- [ ] Hook extension is between half and full stem height.
- [ ] Crossbar length is between 0.5 and 1.0 times the x-height.
- [ ] Glyph and constellation stay inside their panels with at least a 5 mm border.
- [ ] Constellation has five labeled stars A through E and four connecting lines in order.
- [ ] Constellation lines do not cross.
- [ ] Measurements are recorded in millimeters and compared to chosen ranges.
- [ ] Valid alternatives are accepted when the ranges and order are met.

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