Isometric Chaise Lounge at 3:16 Scale: A Drawing Guide

Original tasks 1, 2, 3 / complete keys

Task 1

A chaise lounge seat is 120 cm long and 48 cm wide in reality. At 3:16, what are the paper lengths if 3 cm paper represents 16 cm real?

Answer: Seat length: 120 times 3/16 = 22.5 cm. Seat width: 48 times 3/16 = 9 cm.

Reason: Multiply each real size by the scale factor 3/16. 120 times 3 = 360; 360 divided by 16 = 22.5. 48 times 3 = 144; 144 divided by 16 = 9.

Check: Reverse the calculation: 22.5 times 16/3 = 120, and 9 times 16/3 = 48. Confirm units are centimeters.

Task 2

You draw a scale bar 4.5 cm long and label it 3:16. If 3 cm paper represents 16 cm real, what real length does 4.5 cm represent?

Answer: 4.5 cm paper represents 24 cm real.

Reason: Set up the proportion: 3 cm paper / 16 cm real = 4.5 cm paper / x cm real. Cross-multiply: 3x = 72, so x = 24.

Check: Divide 4.5 by 3 to get 1.5, then multiply 16 by 1.5 to get 24. Confirm the scale bar label matches the proportion used.

Task 3

In an isometric drawing, a seat box has paper length 18 cm and paper width 7.5 cm. At 3:16, what are the real length and width?

Answer: Real length: 96 cm. Real width: 40 cm.

Reason: Multiply paper sizes by 16/3. 18 times 16/3 = 96. 7.5 times 16/3 = 40.

Check: Convert back: 96 times 3/16 = 18, and 40 times 3/16 = 7.5. Check that the ratio 18:7.5 equals 96:40.

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Original tasks 4 / complete keys

Task 4

A backrest is 80 cm tall above the seat in reality. At 3:16, what is its paper height? If your drawing shows 14 cm, is that within 1 cm of the calculated value?

Answer: Calculated paper height: 80 times 3/16 = 15 cm. A drawing of 14 cm is 1 cm less, so it is within 1 cm.

Reason: 80 times 3 = 240; 240 divided by 16 = 15. Compare 14 cm to 15 cm: difference is 1 cm.

Check: Subtract 14 from 15 to get 1. Confirm the tolerance stated in the prompt is 1 cm, so the drawing passes.

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Source rubric / reflection

- [ ] Isometric axes: vertical and two 30-degree axes are consistent throughout.
- [ ] Scale bar: 3:16 bar is present, correctly divided, and labeled.
- [ ] Proportions: seat, backrest, and legs follow the stated hypothetical ratios within reasonable rounding.
- [ ] Dimensions: callouts show real sizes in consistent units and match the scale.
- [ ] Line quality: construction lines are light, visible edges are darkened, hidden lines removed.
- [ ] Lettering: x-height is baseline to midline; style may vary but must be legible.

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