Ceratosaurus Scale Drawing: Plan a Cutout with a Scale Bar

Original task 1 / complete key

Task 1

A drawing is 8 cm long and represents a 40 cm cutout. What is the scale ratio? If the drawn hip height is 2 cm, what real height does it represent?

Answer: Scale ratio = 8 divided by 40 = 1:5. Real hip height = 2 cm times 5 = 10 cm.

Reason: Divide drawn length by real length to get the ratio, then multiply the drawn segment by the same factor.

Check: Multiply 10 cm by 1/5 to return to 2 cm; confirm the ratio is written as 1:5.

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Original task 2 / complete key

Task 2

On a grid, the snout tip is at square 0. The shoulder is 6 squares right and 2 squares up. The hip is 10 squares right and 1 square down. Describe how to plot these points on a blank panel with identical squares.

Answer: Start at the snout tip on the blank panel. Count 6 squares right and 2 up for the shoulder; count 10 squares right and 1 down for the hip. Mark both points and connect them smoothly.

Reason: Identical grids preserve relative positions, so the same square counts transfer the outline proportionally.

Check: Recount the squares from the snout tip to each point and confirm the directions match.

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Original task 3 / complete key

Task 3

A scale bar shows divisions of 0, 2, 4, 6 cm. The printed bar measures 6.2 cm with a ruler. The planned ratio is 1:10. What is the corrected ratio using the measured bar?

Answer: Corrected ratio = 6.2 cm divided by 60 cm, approximately 1:9.68. Label the measured value and use it for checks.

Reason: The scale bar represents 60 cm in reality because 6 cm at 1:10 equals 60 cm. The measured 6.2 cm changes the effective ratio.

Check: Divide 6.2 by 60 and compare with the labelled ratio; record the measured value beside the bar.

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Original task 4 / complete key

Task 4

A cutout outline has a drawn body length of 7 cm at 1:8. A cut margin of 0.5 cm is added around the outline. What real length does the margin represent, and what is the total drawn length including one margin on each end?

Answer: Real margin = 0.5 cm times 8 = 4 cm. Total drawn length = 7 cm plus 0.5 cm plus 0.5 cm = 8 cm.

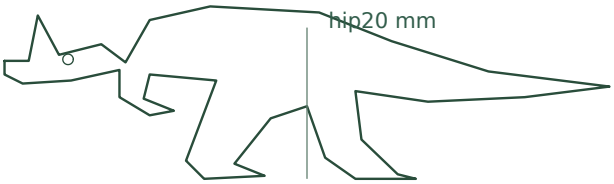
Reason: Multiply the drawn margin by the scale factor to get the real margin. Add the margin at both ends for the total drawn length.

Check: Convert 8 cm drawn back to real length: 8 times 8 = 64 cm, which equals 56 cm body plus 8 cm total margin.

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Task 1 / answers

Hypothetical Ceratosaurus cutout / nasal horn, body, small arms, hind limbs and long tail





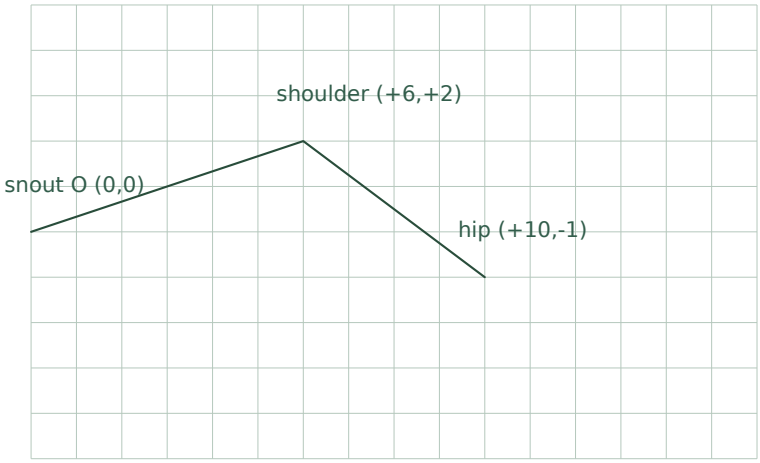
nominal paper cm; intended real span 30 cm

Task1: drawn80 mm / real400 mm=1:5. The chosen internal hip landmark is20 mm above baseline, corresponding to100 mm=10 cm real. This is a hypothetical cutout scale, not a claim about a real specimen.

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Task 2 / answers

Hypothetical Ceratosaurus cutout / nasal horn, body, small arms, hind limbs and long tail



Task2: use the SAME grid pitch on both panels. Relative to snout O, the shoulder is6 right/2 up and hip10 right/1 down. The line joins these plotted points for transfer practice; it is not being claimed as a complete animal outline. A complete horned cutout is on the reference and other relevant answers.

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Task 3 / answers

Hypothetical Ceratosaurus cutout / nasal horn, body, small arms, hind limbs and long tail



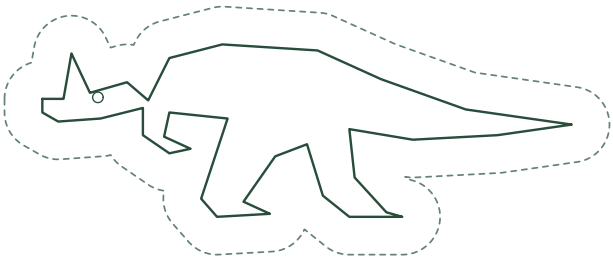
nominal paper cm; intended real span 60 cm

Task3: nominal labels0,2,4,6 cm remain on the given bar, but its actual measured paper length is62 mm=6.2 cm. It represents600 mm=60 cm in the hypothetical real cutout. Correct ratio62/600 is1:9.6774, about1:9.68. These are the problem givens, not a statement that every printer stretches a nominal6 cm bar.

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Task 4 / answers

Hypothetical Ceratosaurus cutout / nasal horn, body, small arms, hind limbs and long tail



5 mm offset all around / total80 mm

Task4: animal longitudinal length70 mm at1:8 gives560 mm real. A TRUE5 mm offset surrounds the whole silhouette, not merely a rectangular bounding box. The actual end-to-end offset envelope is80 mm. Each5 mm paper margin represents40 mm=4 cm real; total640 mm=560+40+40.

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Source rubric / reflection

- [ ] Scale ratio is stated and matches the measured scale bar.
- [ ] Grid counts from the snout tip to key points are consistent.
- [ ] Body axis and key points are marked before details.
- [ ] Cut line is distinct from construction lines and has a labelled margin.
- [ ] Labels use one unit and follow the baseline-to-midline x-height convention.
- [ ] Valid alternative letter styles and outline curves are accepted if measurements check.

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