Draw a Seated Cyclist: Pedaling Legs and Balance

Original tasks 1, 2 / complete keys

Task 1

Use a 2 cm head unit, a 3 cm thigh, and a 2.5 cm lower leg. The pedal-path oval is centered at (0,−3 cm) relative to the hip and is 8 cm wide by 3 cm tall. For the forward-up leg, place the knee 3 cm from hip and 0.5 cm above it. Give a foot point near (2.96,−2.00) cm on the front upper arc and verify the lower-leg distance.

Answer: Place the knee at (2.96,0.5) cm relative to the hip and the foot at about (2.96,−2.0) cm. Their horizontal difference is 0 and vertical difference is 2.5 cm, so the lower-leg length is 2.5 cm. The hip-to-knee distance is $\sqrt{(2.96^2+0.5^2)}\approx 3.00$ cm. The foot lies near the front upper arc of the stated oval.

Reason: The chosen coordinates satisfy both segment lengths: the vertical knee-to-foot difference is 2.5 cm, and $\sqrt{(2.96^2+0.5^2)}$ is approximately 3 cm. The pedal oval provides a visible guide for the foot position.

Check: Compute $\sqrt{(2.96^2+0.5^2)}\approx 3.00$ cm for hip-to-knee, then verify the vertical knee-to-foot difference is 2.5 cm. The foot at about (2.96,−2.00) lies near the front upper arc of an 8-by-3 cm ellipse centered at (0,−3): $(2.96/4)^2+(1/1.5)^2\approx 0.992$.

Task 2

Using a 2 cm head unit, a 3 cm thigh and a 2.5 cm lower leg, draw the back-down leg. Use an 8.3 cm by 3 cm pedal-path oval centered at (0,−3 cm) relative to the hip. Place the knee about 2.47 cm backward and 1.7 cm below hip, and the foot at the same horizontal position on the lower-left arc. Verify the segment lengths.

Answer: Place the knee at (−2.47,−1.7) cm and the foot at about (−2.47,−4.2) cm. The lower-leg distance is 2.5 cm vertically. The thigh distance is $\sqrt{(2.47^2+1.7^2)}=\sqrt{(6.1009+2.89)}=\sqrt{8.9909}\approx 3.00$ cm. For the ellipse with semiaxes 4.15 and 1.5 cm, the foot’s normalized squared position is $(2.47/4.15)^2+(1.2/1.5)^2\approx 0.995$, so it lies near its lower-left arc.

Reason: The coordinates give a thigh of about 3 cm and a lower leg of 2.5 cm. The pedal oval locates the foot on the back-down part of its path, distinct from the forward-up exercise.

Check: Calculate $\sqrt{(2.47^2+1.7^2)}\approx 3.00$ cm and check the 2.5 cm vertical knee-to-foot gap. Confirm the foot is near the ellipse boundary using $(2.47/4.15)^2+(1.2/1.5)^2\approx 0.995$.

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Original tasks 3, 4 / complete keys

Task 3

A drawing shows both knees at the same height and both feet on the same side of the pedal oval. What is the main pose error and how do you fix it?

Answer: The legs are not alternating. Move one knee forward-up and the other back-down, placing feet on opposite sides of the pedal oval.

Reason: The drawing cue requires different knee heights and feet on different parts of the pedal-path oval. It is a visual alternation check, not a biomechanical claim.

Check: Check that one knee is above the hip line and the other below it.

Task 4

The vertical line from the hip point falls 3 cm behind the seat center on a 12 cm balance line. For this exercise only, count a hip drop within 1 cm horizontally of the seat center as aligned; this is a worksheet drawing convention, not a real balance standard. Is the drawing within that convention? How could you adjust?

Answer: No. The 3 cm gap exceeds this exercise’s 1 cm alignment limit. Move the hip or seat mark so their horizontal separation is 1 cm or less, then redraw the vertical guide.

Reason: The exercise defines 1 cm as its visual alignment tolerance. This is a drawing convention only and does not measure real rider stability.

Check: Measure the horizontal distance from the hip drop to the drawn seat center; confirm it is no more than 1 cm after adjustment.

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Source rubric / reflection

- [ ] Seated pose is clear: hip, shoulder, and head align with a slight forward lean.
- [ ] Pedaling legs alternate: one forward-up, one back-down, both knees bent.
- [ ] Feet stay on the pedal oval and hands sit at handlebar height.
- [ ] The hip-to-ground reference falls near the drawn seat mark as a visual alignment cue.
- [ ] Proportions use a consistent head unit; valid alternatives are accepted if relationships stay consistent.

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