Draw a Bicycle: Frame Geometry, Wheels, and Handlebar

Original tasks 1, 2, 3 / complete keys

Task 1

On a ground line, mark two wheel centers 80 mm apart (hypothetical example). Draw two equal circles with radius 25 mm each. State the wheelbase and verify equal radii.

Answer: Wheelbase is 80 mm. Both radii measure 25 mm from center to rim, so the circles are equal and both touch the ground line.

Reason: The wheelbase is the distance between centers. Equal radii are checked by measuring each circle from its own center to its rim.

Check: Measure center-to-center distance and each radius with a ruler; compare the two radius measurements.

Task 2

Place a bottom bracket 15 mm above the ground line between two wheel centers. Draw a chainstay to the rear wheel center and a seat tube upward. Describe how you check that the rear triangle can close.

Answer: The chainstay runs from bottom bracket to rear wheel center. The seat tube rises from the bottom bracket. The rear triangle closes when a line from the seat area reaches the rear wheel center, forming a closed three-sided shape.

Reason: A triangle needs three connected sides. The rear triangle uses chainstay, seat tube region, and the line from seat area to rear wheel center.

Check: Trace the three sides with a finger; each joint should meet at a clear intersection without gaps.

Task 3

Draw a main triangle using a head tube, top tube, down tube, and seat tube. Label the bottom bracket and head tube. Explain one way to verify the triangle is closed.

Answer: The top tube connects seat area to head tube; the down tube connects head tube to bottom bracket; the seat tube connects bottom bracket to seat area. The triangle is closed when all three connections meet at clear points.

Reason: Closing a triangle means every side shares endpoints with the other sides. Clear intersections make the structure readable.

Check: Start at the bottom bracket and follow each side to the next joint; you should return to the starting point without a gap.

Draw a Bicycle: Frame Geometry, Wheels, and Handlebar

Original tasks 4 / complete keys

Task 4

Add a handlebar assembly to a head tube: stem upward, bar forward, two grips. Then add a saddle above the seat tube and a crank circle with pedal line at the bottom bracket. List three checks for this detail set.

Answer: Checks: stem connects head tube to bar; bar has two distinct grip ends; saddle sits above seat tube; crank circle is centered at bottom bracket; pedal line attaches to crank. Any legible labels follow baseline-to-midline x-height convention.

Reason: Each detail must connect to its structural anchor: stem to head tube, saddle to seat tube, crank to bottom bracket. Separating parts prevents vague single-line shapes.

Check: Point to each anchor and its attached part; verify no part floats without a connection and no joint is ambiguous.

Draw a Bicycle: Frame Geometry, Wheels, and Handlebar

Source rubric / reflection

- [ ] Two wheel circles are equal in radius and touch the ground line.
- [ ] Wheel centers are marked and the wheelbase is labeled with a chosen example value.
- [ ] Bottom bracket is above the ground line and connects to chainstay and seat tube.
- [ ] Rear triangle and main triangle are closed at clear intersections.
- [ ] Front fork connects head tube to front wheel center.
- [ ] Handlebar assembly separates stem, bar, and grips.
- [ ] Saddle, crank, and pedal are present and clearly placed.
- [ ] Construction lines are light or removed; final lines are clear.
- [ ] Any lettering follows baseline-to-midline x-height convention; alternative letter styles are accepted if legible.
- [ ] No cyclist figure or brand-specific details are included.

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