Draw a Motorbike: Wheel, Frame and Handlebar Construction

Original tasks 1, 2, 3 / complete keys

Task 1

A practice drawing has front wheel radius 3 units and rear wheel radius 3 units, centres 12 units apart. The front wheel bottom is 1 unit above the ground line. What change makes both wheels touch the ground line?

Answer: Lower the front wheel circle by 1 unit so its bottom touches the ground line, or raise the ground line by 1 unit.

Reason: Both circles must share the same ground line; moving one circle or the line by the same amount restores contact.

Check: Measure the gap between each wheel bottom and the ground line; both should read zero.

Task 2

The steering head is 2 units above and 1 unit behind the front wheel centre. The fork axis is drawn as a straight line from steering head to a point 2 units to the right of the front wheel centre. Does the fork meet the wheel centre?

Answer: No. The fork axis must pass through the front wheel centre cross.

Reason: A line ending 2 units right of the centre misses the reference point, so the fork and wheel are misaligned.

Check: Trace the fork axis and confirm it crosses the front wheel centre cross.

Task 3

A frame triangle has vertices at steering head, swingarm pivot and seat point. The line from steering head to swingarm pivot passes through the rear wheel circle. What is the simplest correction?

Answer: Move the swingarm pivot closer to the rear wheel centre or shorten the triangle so the line stays clear of the circle.

Reason: The frame triangle should sit in the space between the wheels; crossing a wheel circle signals an overlong frame line.

Check: Redraw the triangle and check that no side crosses either wheel circle.

Draw a Motorbike: Wheel, Frame and Handlebar Construction

Original tasks 4 / complete keys

Task 4

A handlebar line is drawn parallel to the fork axis. Using the convention, what relationship should the handlebar have to the fork in side view?

Answer: The handlebar should cross the steering head and be roughly perpendicular to the fork.

Reason: The handlebar mounts at the steering head and extends across the fork, not along it.

Check: Compare the angle between handlebar and fork lines; a rough right angle confirms the convention.

Draw a Motorbike: Wheel, Frame and Handlebar Construction

Source rubric / reflection

- [ ] Both wheel circles touch the same ground line.
- [ ] Wheel centres are marked and used as reference points.
- [ ] Frame triangle is closed and does not cross either wheel circle.
- [ ] Fork axis passes through the front wheel centre.
- [ ] Handlebar crosses the steering head and is roughly perpendicular to the fork in side view.
- [ ] Valid alternatives in wheel size, fork angle or seat length are accepted when the relationships above hold.

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