Joint-Angle Mannequin Sketches: A Practice Guide for Pose Drawing

Original tasks 1, 2 / complete keys

Task 1

Draw a standing mannequin with the torso vertical at 90 degrees. The right arm points straight up at 90 degrees from the shoulder. The left arm points straight down at 270 degrees. Both legs point straight down at 270 degrees. Label all segment angles and joint angles. Use a horizontal baseline.

Answer: Torso: 90 degrees. Right arm: 90 degrees. Left arm: 270 degrees. Right leg: 270 degrees. Left leg: 270 degrees. Right shoulder joint angle: the smaller angle between torso (90) and arm (90) is 0 degrees, because the segments point in the same direction. Left shoulder joint: smaller angle between 90 and 270 is 180 degrees. Hip joints: between torso (90) and each leg (270) is 180 degrees. Knee joints: each leg is drawn as one straight line, so the knee joint angle is 0 degrees.

Reason: Segment angles are measured from the baseline. Joint angles use the smaller angle between connected segments. Parallel segments give 0 degrees; opposite directions give 180 degrees. The answer notes the parallel case explicitly to avoid confusion.

Check: Measure the right shoulder angle with a protractor; it should read 0 degrees because both the torso and right arm are at 90 degrees (same direction). Confirm the knee joints are labeled 0 degrees because each leg is a single straight line. Confirm all labels use degree symbols and the baseline is marked 0 degrees at the right.

Task 2

Draw a mannequin with the torso leaning right at 45 degrees from the hip. The right thigh points right at 0 degrees. The right shin points up at 90 degrees. The left thigh points left at 180 degrees. The left shin points down at 270 degrees. Label all segment angles and joint angles.

Answer: Torso: 45 degrees. Right thigh: 0 degrees. Right shin: 90 degrees. Left thigh: 180 degrees. Left shin: 270 degrees. Right knee joint: smaller angle between 0 and 90 is 90 degrees. Left knee joint: smaller angle between 180 and 270 is 90 degrees. Right hip joint: smaller angle between torso (45) and thigh (0) is 45 degrees. Left hip joint: smaller angle between torso (45) and thigh (180) is 135 degrees.

Reason: Each joint angle is the smaller difference between the two connected segment angles. The right hip is 45 degrees because the torso leans 45 degrees from the right-pointing thigh. The left hip is 135 degrees because the left thigh points opposite the torso's lean.

Check: Use a protractor at the right hip to confirm 45 degrees and at the left hip to confirm 135 degrees. Also verify the arithmetic: right hip = smaller of |45 - 0| = 45 and 360 - 45 = 315, so 45 degrees; left hip = smaller of |45 - 180| = 135 and 360 - 135 = 225, so 135 degrees. Confirm every label includes a degree symbol and that segment angles are measured from the horizontal baseline.

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Original tasks 3, 4 / complete keys

Task 3

Draw a mannequin in a running pose. The torso is at 80 degrees. The right arm is at 30 degrees. The left arm is at 150 degrees. The right thigh is at 300 degrees. The right shin is at 240 degrees. The left thigh is at 120 degrees. The left shin is at 60 degrees. Label all segment angles and joint angles.

Answer: Torso: 80 degrees. Right arm: 30 degrees. Left arm: 150 degrees. Right thigh: 300 degrees. Right shin: 240 degrees. Left thigh: 120 degrees. Left shin: 60 degrees. Right shoulder joint: smaller angle between 80 and 30 is 50 degrees. Left shoulder joint: smaller angle between 80 and 150 is 70 degrees. Right hip joint: smaller angle between 80 and 300 is 140 degrees (difference 220, smaller 140). Left hip joint: smaller angle between 80 and 120 is 40 degrees. Right knee joint: smaller angle between 300 and 240 is 60 degrees. Left knee joint: smaller angle between 120 and 60 is 60 degrees.

Reason: For each joint, subtract the two segment angles and take the smaller value (if the difference exceeds 180, subtract from 360). The right hip difference is 220, so the smaller angle is 140. All other differences are already less than 180.

Check: Measure the right hip angle with a protractor; it should read about 140 degrees. Confirm that the right knee and left knee both read about 60 degrees. Check that every label includes a degree symbol.

Task 4

Draw a mannequin with the torso at 270 degrees (pointing down, as if inverted). The right arm is at 0 degrees. The left arm is at 180 degrees. The right leg is at 90 degrees. The left leg is at 90 degrees. Label all segment angles and joint angles. Note any joint where the smaller angle is ambiguous.

Answer: Torso: 270 degrees. Right arm: 0 degrees. Left arm: 180 degrees. Right leg: 90 degrees. Left leg: 90 degrees. Right shoulder joint: smaller angle between 270 and 0 is 90 degrees. Left shoulder joint: smaller angle between 270 and 180 is 90 degrees. Right hip joint: smaller angle between 270 and 90 is 180 degrees. Left hip joint: 180 degrees. No joint is ambiguous because all differences are less than or equal to 180. The torso pointing down is unusual but valid under the convention.

Reason: The smaller angle is always taken. For the right shoulder, the difference between 270 and 0 is 270, so the smaller angle is 360 minus 270, which is 90. The hip joints are straight because the torso and legs point in opposite directions.

Check: Measure the right shoulder angle; it should be 90 degrees. Confirm that the hip joints are drawn as straight lines through the joint circles and labeled 180 degrees. Check that the torso label is 270 degrees and not confused with a negative value.

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Source rubric / reflection

- [ ] Every joint is marked with a clear circle.
- [ ] Every segment is drawn as a straight line between joint circles.
- [ ] Every segment angle is labeled from the horizontal baseline with a degree symbol.
- [ ] Every joint angle is labeled as the smaller angle between connected segments.
- [ ] Drawn angles match labeled angles within 10 degrees when measured with a protractor.
- [ ] The sketch could be redrawn from the labels alone by another person.
- [ ] The convention is applied consistently across all joints and segments.

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