Isometric Conveyor Belt Drawing: Axes, Frame, Rollers, and Belt Surface

Original tasks 1, 2, 3 / complete keys

Task 1

Draw an isometric frame with length 4 units, width 2 units, and height 1 unit. Use 1 unit equals 15 mm as a hypothetical example. No rollers or belt.

Answer: A closed rectangular frame: top rectangle 60 mm by 30 mm along the 30-degree axes, vertical edges 15 mm, lower rectangle parallel to the top.

Reason: Mark 60 mm along the right axis and 30 mm along the left axis from the origin, complete the top rectangle, drop 15 mm vertical edges, and close the bottom.

Check: Measure opposite edges for parallelism and confirm vertical edges are vertical with a straightedge.

Task 2

Add three rollers to the frame from the previous exercise at equal intervals along the length. Describe their orientation.

Answer: Three short lines parallel to the width axis, spaced equally along the length axis.

Reason: Divide the 60 mm length into four equal intervals of 15 mm and mark roller positions at 15, 30, and 45 mm from the start.

Check: Measure the intervals with a ruler; each should be equal within a small tolerance.

Task 3

Draw a belt surface over the rollers from the previous exercise, resting on the roller lines (or offset by the belt thickness above the roller contact line). State the shape and orientation.

Answer: A long parallelogram parallel to the frame top, resting on the roller lines (or offset by the belt thickness above the roller contact line), with a thin side edge along the length.

Reason: Copy the frame top rectangle, place the belt top on the roller lines (or shift it upward by the belt thickness above the roller contact line), and connect the side edges to show belt thickness.

Check: Confirm the belt top is parallel to the frame top and the offset is consistent along the length.

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Original tasks 4 / complete keys

Task 4

Redraw the complete conveyor belt on a blank area using the same axes but a length of 5 units and width of 2 units. Use 1 unit equals 12 mm as a hypothetical example. Keep roller spacing equal.

Answer: A complete isometric conveyor: frame 60 mm by 24 mm by 12 mm, rollers at equal intervals along the length, and a belt surface parallel to the frame top.

Reason: Set the axes, block the frame, mark equal roller intervals, draw the belt parallelogram, and clean construction lines.

Check: Check all edges against the three axes, measure roller intervals, and confirm the belt offset is consistent.

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Source rubric / reflection

- [ ] All length edges are parallel to the right 30-degree axis within a small tolerance.
- [ ] All width edges are parallel to the left 30-degree axis within a small tolerance.
- [ ] All height edges are vertical.
- [ ] Frame top and bottom rectangles are closed and proportional.
- [ ] Roller spacing is equal along the length axis.
- [ ] Belt surface is parallel to the frame top and offset consistently.
- [ ] Line convention is consistent; alternative roller-end styles are acceptable.
- [ ] Construction lines are removed or clearly subordinate.

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