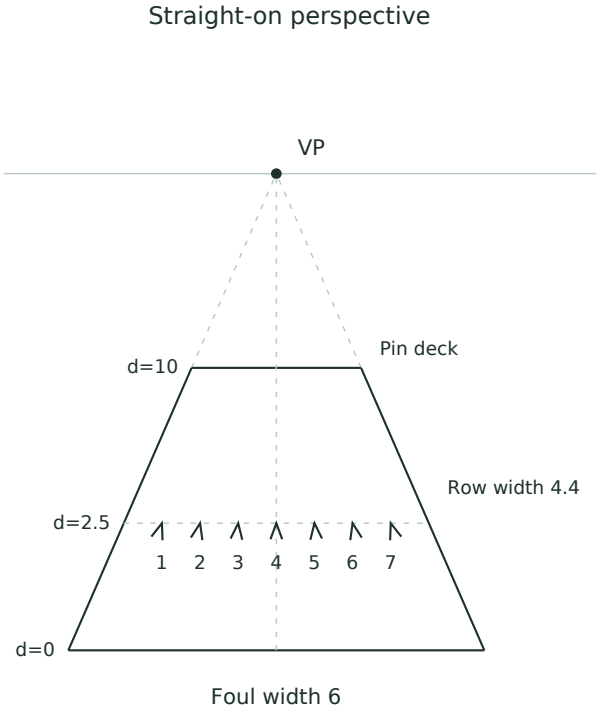
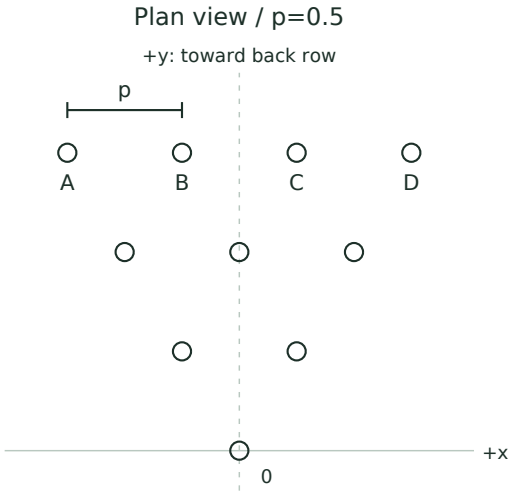
Bowling Lane Drawing: One-Point Perspective with Pins and Arrows

COMPLETED STRAIGHT VIEW / WORKED EXAMPLE

Draw a one-point perspective lane 10 units long with a 6-unit foul-line width. At the arrow row 2.5 units from the foul line, assume the measured lane width is 4.4 units. Place seven arrows at that cross-section and add a separate plan-view inset for the pin rack using pitch p=0.5 drawing units.





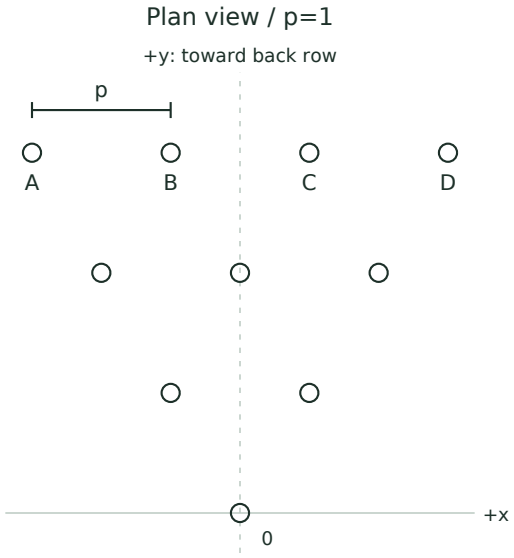
Draw the lane edges converging to the vanishing point and mark the pin deck at 10 units. Divide the measured 4.4-unit arrow-row width into 8 gaps of 0.55 units; place arrow tips at 0.55, 1.10, 1.65, 2.20, 2.75, 3.30, and 3.85 units from the left gutter. In the separate plan-view inset, use head center (0,0); row two (−0.25,0.433) and (0.25,0.433); row three (−0.5,0.866), (0,0.866), (0.5,0.866); and row four (−0.75,1.299), (−0.25,1.299), (0.25,1.299), (0.75,1.299). Label the inset “plan view.”

Check: eight gaps of 0.55 across 4.4; ten plan-view spots with adjacent pitch 0.5. The represented 10-unit deck remains below the VP. Hypothetical drawing: d labels represent scene depth, not equal paper ruler intervals. Transverse widths use illustration coordinates. The plan-view rack has its own scale, with positive y toward the back row.

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EXERCISE 1 / ANSWERS

In a separate plan-view pin-rack inset, choose pitch p=1 drawing unit and put the head pin center at (0,0). Give the coordinates of all four centers in the back row, explain the row’s symmetry, and state the row depth.



Plan-view convention: 1/2/3/4 centered rows, x=0 vertical, positive y to the back row. Adjacent-row rise is √3p/2; the inset is not perspective.

The four back-row centers are (−1.5, 3√3/2), (−0.5, 3√3/2), (0.5, 3√3/2), and (1.5, 3√3/2), so the row depth is about 2.598 units. The positions are symmetric in pairs about x=0, with adjacent horizontal gaps of 1 unit.

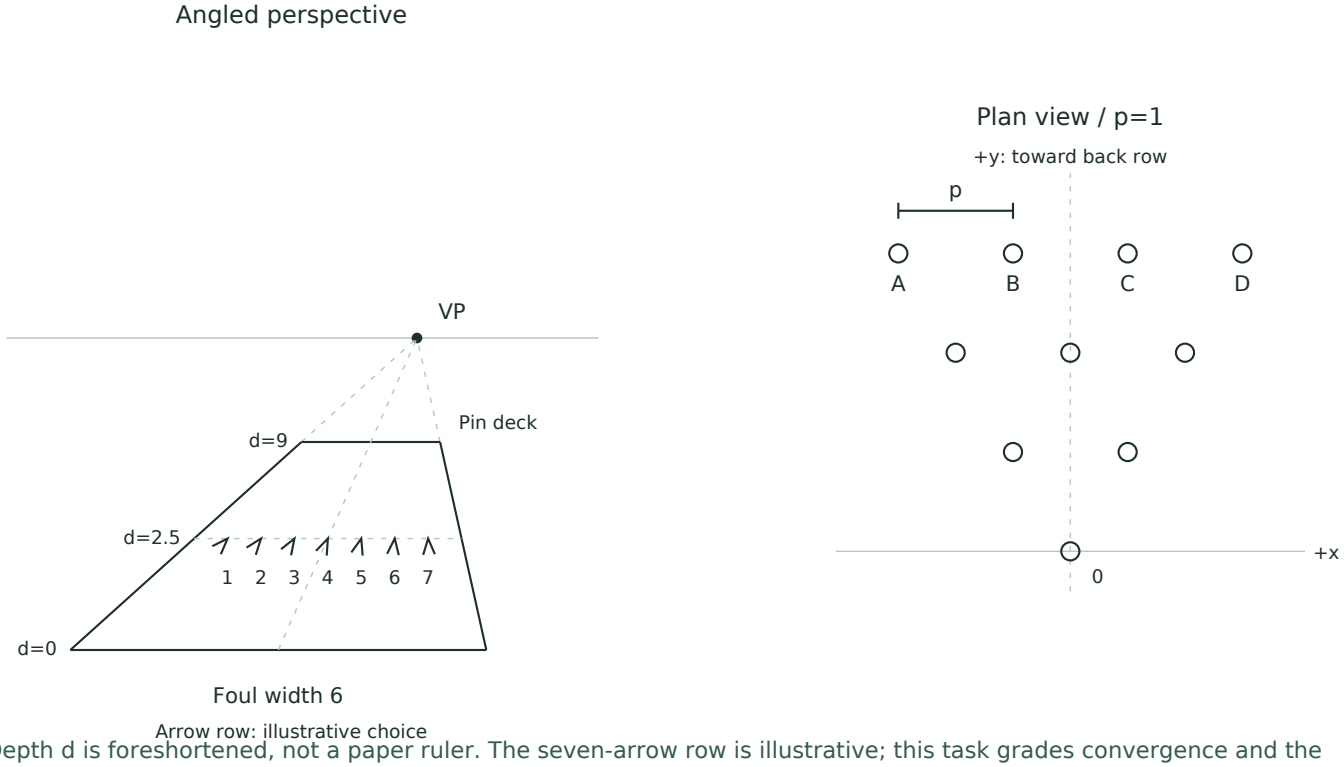
Why: The ten-spot pattern is an equilateral triangular lattice. With p=1, the fourth row has x offsets −3p/2, −p/2, p/2, and 3p/2 and y=3√3p/2 from the head-pin row.

Check: Confirm there are four centers, their x coordinates are equally spaced by 1, and each pair at ±0.5 and ±1.5 mirrors across x=0. Check that the back-row depth equals 3√3/2≈2.598 units.

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EXERCISE 2 / ANSWERS / CONSTRUCTION

Draw an angled one-point perspective lane 9 units long with a 6-unit foul-line width and the vanishing point to the right of the foul-line center. Beside it, draw a separate plan-view pin-rack inset with p=1 drawing unit and these centers: head (0,0); row two (−0.5, √3/2) and (0.5, √3/2); row three (−1, √3), (0, √3), (1, √3); row four (−1.5, 3√3/2), (−0.5, 3√3/2), (0.5, 3√3/2), and (1.5, 3√3/2). Explain which lane lines converge and how to check the inset.



Depth d is foreshortened, not a paper ruler. The seven-arrow row is illustrative; this task grades convergence and the listed p=1 inset coordinates.

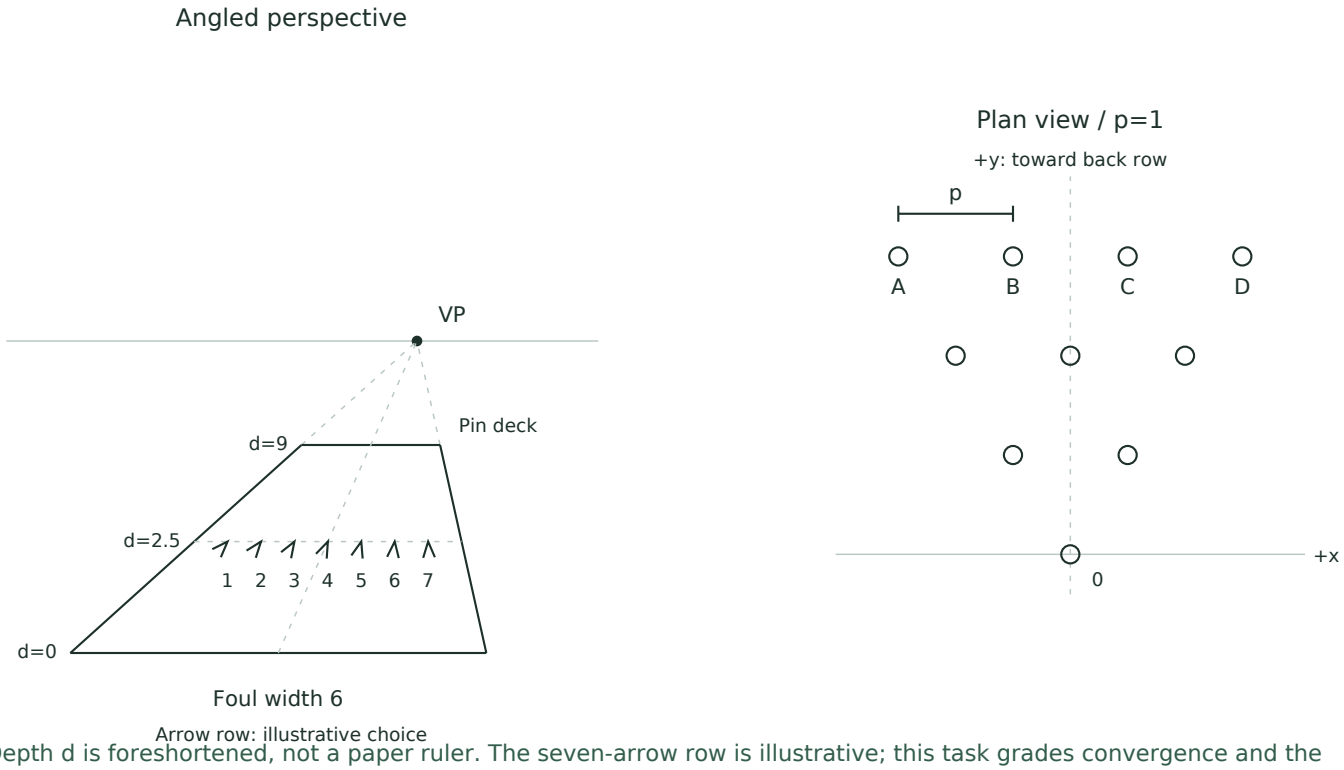
Draw the foul line and gutter edges so the lane edges converge to the offset vanishing point; the centerline follows the same vanishing point. Draw the ten inset centers at the listed coordinates and label the inset “plan view.” The pin layout is symmetric about x=0 with adjacent pitch p=1; do not rotate or project those equal gaps onto the perspective lane.

The next page repeats the completed figure and gives the full reasoning and measurement check.

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EXERCISE 2 / ANSWERS / EXPLANATION

Continued exercise 2: the full question and coordinate list are on the preceding construction page. This page gives the complete explanation and check.



Depth d is foreshortened, not a paper ruler. The seven-arrow row is illustrative; this task grades convergence and the listed p=1 inset coordinates.

Draw the foul line and gutter edges so the lane edges converge to the offset vanishing point; the centerline follows the same vanishing point. Draw the ten inset centers at the listed coordinates and label the inset “plan view.” The pin layout is symmetric about x=0 with adjacent pitch p=1; do not rotate or project those equal gaps onto the perspective lane.

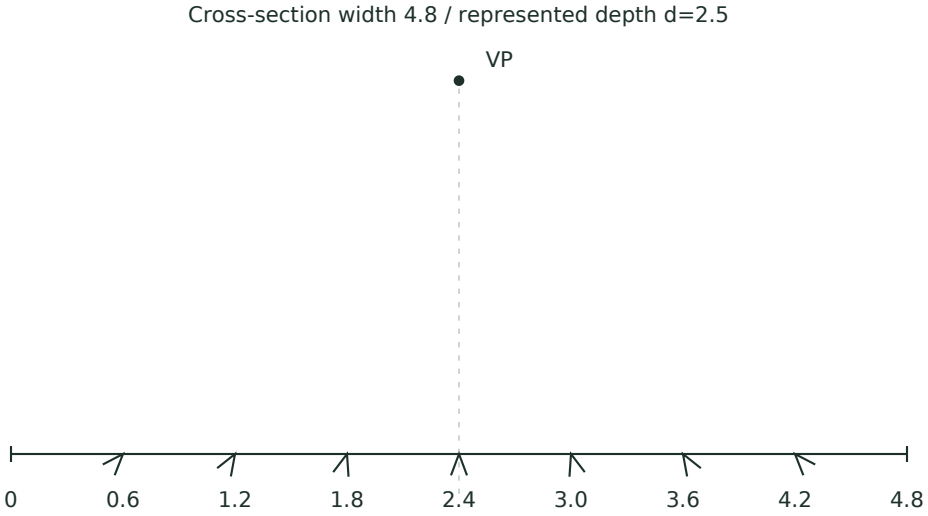
Why: The offset vanishing point affects the apparent lane direction but does not alter the separate top-view coordinates. Keeping the views separate prevents an equal-pitch plan diagram from being mistaken for a perspective projection.

Check: Confirm the lane gutter edges and centerline converge to the marked vanishing point. Count one, two, three, and four centers in successive inset rows; check every neighboring pair is one unit apart and mirror pairs have equal and opposite x coordinates. Confirm the inset is labeled plan view.

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EXERCISE 3 / ANSWERS

At a cross-section 2.5 units from the foul line, assume the measured lane width is 4.8 units (a hypothetical drawing value). Place seven arrows symmetrically across it and state the check.



Eight gaps of 0.6; center at 2.4 from left

This isolated cross-section is at represented depth 2.5. No foul-line width, deck width or equal paper-depth scale is inferred from it.

Divide the 4.8-unit width into eight equal spaces of 0.6 units; the seven interior division points at 0.6, 1.2, 1.8, 2.4, 3.0, 3.6, and 4.2 units from the left gutter are the seven arrow positions, with the center arrow at 2.4 units on the center line. Check that left and right arrows are mirror images and that tips point toward the vanishing point.

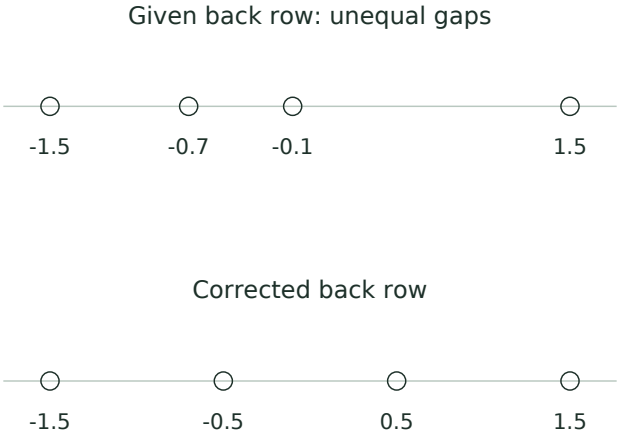
Why: Seven arrows divide the stated 4.8-unit width into eight equal spaces. The 0.6-unit positions mirror around the center line; the width is given as a cross-section measurement and is not inferred by linear interpolation.

Check: Measure distances from the center line to each arrow; confirm equal pairs. Confirm the center arrow lies on the center line and that arrow tips align with converging lines.

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EXERCISE 4 / ANSWERS

In a plan-view rack inset with pitch p=1 drawing unit, the four back-row centers are shown at x=−1.5, −0.7, −0.1, and 1.5. Identify the spacing error and give corrected coordinates for the row.



The upper row is the given error. The lower workspace is a separate corrected-row diagram, not a different physical rack depth.

The gaps are 0.8, 0.6, and 1.6 units, so they are not equal. Replace the positions with x=−1.5, −0.5, 0.5, and 1.5 at y=3√3/2. The corrected row is centered at x=0 and each adjacent gap is 1 unit.

Why: A four-center row on the triangular lattice uses offsets −3p/2, −p/2, p/2, and 3p/2. With p=1, consecutive x coordinates differ by exactly 1 and the outer pair is symmetric about the centerline.

Check: Subtract consecutive x positions. The corrected differences are 1, 1, and 1; the midpoint of the outer centers is (−1.5+1.5)/2=0, and the row depth is 3√3/2.