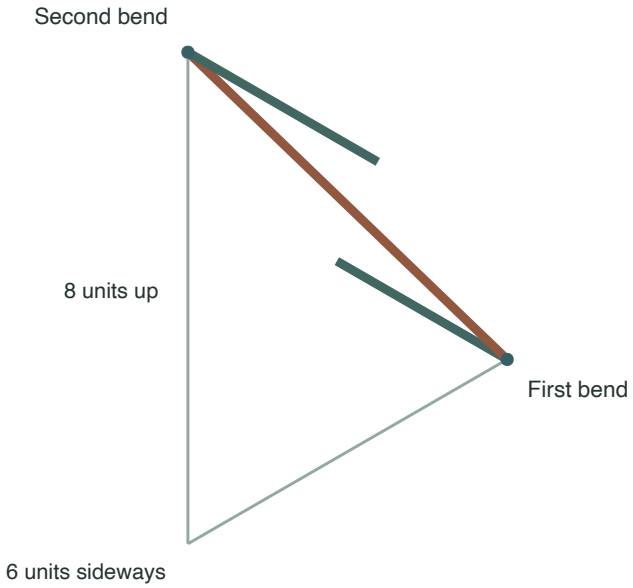
Rolling Offset Isometric Drawing

Original prompt

Task 1: Draw a rolling offset with horizontal change 6 units and vertical change 8 units. Compute the travel length and label the two bend points.



True travel: 10 units. Diagram uses isometric projection.

Answer

Travel = square root of (6 squared + 8 squared) = square root of (36 + 64) = square root of 100 = 10 units. The drawing shows the first bend at the origin, the travel rising to the second bend point 6 units along the second horizontal axis and 8 units up, and the run continuing parallel to the original axis.

Reasoning

The horizontal and vertical changes are the legs of a right triangle; the travel is the hypotenuse. 36 + 64 = 100, and the square root of 100 is 10.

Check

Check both bend points and the parallel end runs. Only the travel moves away from the axes. Verify 6 squared + 8 squared = 100 and the square root is 10.

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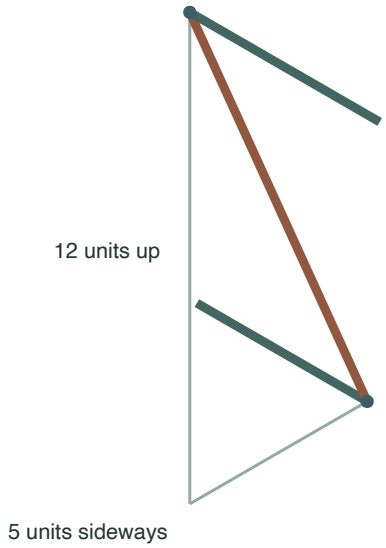
Task 2: Draw a rolling offset with horizontal change 5 units and vertical change 12 units. Compute the travel length and show the travel as the only slanted segment.



True travel: 13 units. Diagram uses isometric projection.

Answer

Travel = square root of (5 squared + 12 squared) = square root of (25 + 144) = square root of 169 = 13 units. The drawing shows the first bend at the origin, the travel rising to the second bend point 5 units along the second horizontal axis and 12 units up, and the run continuing parallel to the original axis.

Reasoning

The horizontal and vertical changes are the legs of a right triangle; the travel is the hypotenuse. 25 + 144 = 169, and the square root of 169 is 13.

Check

Check both bend points and the parallel end runs. Only the travel moves away from the axes. Verify 5 squared + 12 squared = 169 and the square root is 13.

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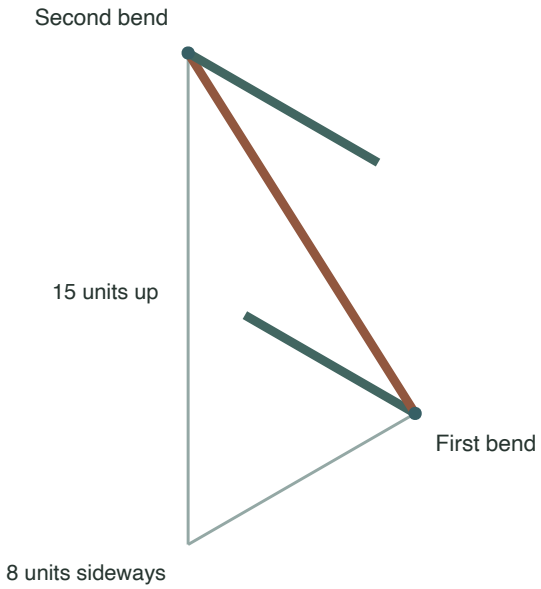
Task 3: Draw a rolling offset with horizontal change 8 units and vertical change 15 units. Compute the travel length and label the two bend points.



True travel: 17 units. Diagram uses isometric projection.

Answer

Travel = square root of (8 squared + 15 squared) = square root of (64 + 225) = square root of 289 = 17 units. The drawing shows the first bend at the origin, the travel rising to the second bend point 8 units along the second horizontal axis and 15 units up, and the run continuing parallel to the original axis.

Reasoning

The horizontal and vertical changes are the legs of a right triangle; the travel is the hypotenuse. 64 + 225 = 289, and the square root of 289 is 17.

Check

Check both bend points and the parallel end runs. Only the travel moves away from the axes. Verify 8 squared + 15 squared = 289 and the square root is 17.

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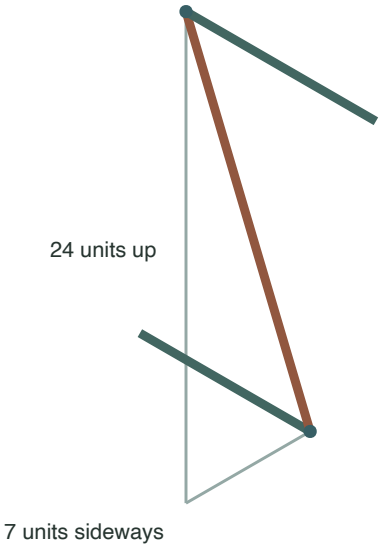
Task 4: Draw a rolling offset with horizontal change 7 units and vertical change 24 units. Compute the travel length and show the travel as the only slanted segment.



True travel: 25 units. Diagram uses isometric projection.

Answer

Travel = square root of (7 squared + 24 squared) = square root of (49 + 576) = square root of 625 = 25 units. The drawing shows the first bend at the origin, the travel rising to the second bend point 7 units along the second horizontal axis and 24 units up, and the run continuing parallel to the original axis.

Reasoning

The horizontal and vertical changes are the legs of a right triangle; the travel is the hypotenuse. 49 + 576 = 625, and the square root of 625 is 25.

Check

Check both bend points and the parallel end runs. Only the travel moves away from the axes. Verify 7 squared + 24 squared = 625 and the square root is 25.