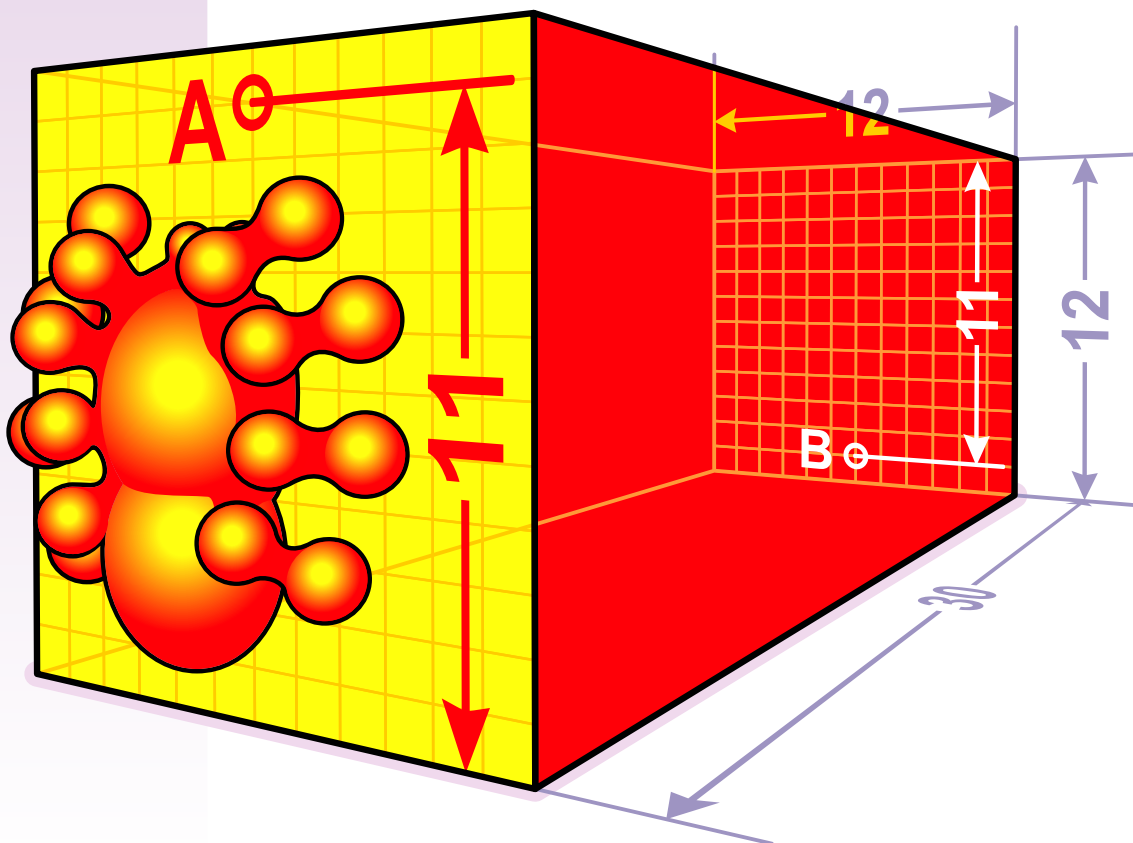


Treasure of Classic
and Modern Puzzles

Geometrical Puzzles



Spider Ride

by Sam Loyd

A rectangular box is 30 units long, 12 units wide, and 12 units high. A Spider starting from spot A should reach spot B. Spot A is midway from the sides of the box and 1 unit from its top. Spot B is midway from the sides of the box, 1 unit from the bottom of the box, and on the opposite side from A. The box, its dimensions and the proper locations of spots A and B are shown in the illustration.

What is the shortest way for the Spider to reach spot B? During the journey from A to B the Spider can use any side and edge of the box. Hint: the shortest distance between A and B is less than 42 units.

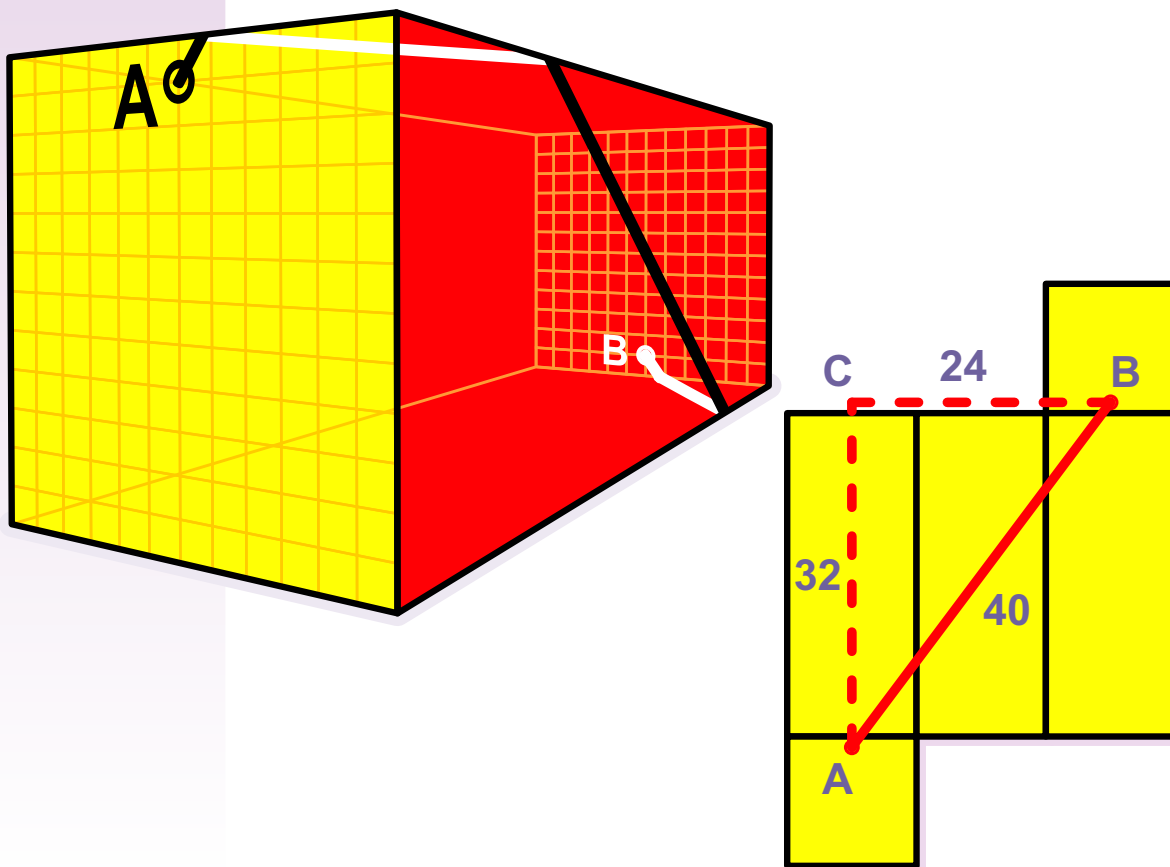
April 13, 2004

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Spider Ride (solution)

At first glance it seems that the shortest distance between A and B is the straight way along the sides of the box, i.e. 1 unit up, 30 units along the top side of the box and then 11 units down the opposite side - 42 units in total. But as it was stated in the hint the shortest distance between A and B is less than 42.

To find the shortest distance out it is useful to unfold some sides of the box into a 2D model. If to unfold them as shown in the lower right corner of the illustration, we get a right triangle where the hypotenuse AB is the distance between the two spots. It equals square root of $(AC^2 + BC^2)$. AC is 32 units long (1 + 30 + 1) and BC is 24 units long (6 + 12 + 6). Thus the distance AB equals square root $(32^2 + 24^2) =$ square root of 1600 or 40.

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