Solution 252

by David Lindell, LS

This problem has three solutions. By inspection it is somewhere in grid Q-18.

First, you could continue to draw additional smaller figures, A″B″C″D″, A‴B‴C″D‴, etc. They will come to a point, eventually.

Second, extend A′D′ to intersect AD at point P′. Draw a circle through A, P′ and A′. Draw another circle through D, D′ and P′. The intersection of the circles is the exact point that is the same on ABCD and A′B′C′D′. (Note, any one of the four lines of A′B′C′D′ could have been extended to meet its counterpart.)

Third, using the construction above, calculate the position:

Let the lower left-hand corner of the square labeled “33” be North = 0, East = 0. Let each square equal ten units by ten units. That will make the upper right-hand corner of the square labeled “Z” equal North = 340, East = 270 and the upper left-hand corner of the vacant square to the left of the square labeled “A” equal North = 340, East = 0. From the given distances, D′ equals North = 220, East = 130. The intersection at P′ will be North = 237.115, East = 0. The midpoint of AP′ will then be N= 288.558, E = 0. Using a distance of 113.333 for D′A′, A′ will be N = 205.207, E= 242.363, and the midpoint of P′A′ will be N = 221.161, E = 121.182. The perpendicular bisectors of AP′ and A′P′ will intersect at N = 288.557, E = 130.055 and the radius of the circle will be 139.859.

The midpoint of DP′ is N = 118.557, E = 0 and the midpoint of P′D′ is N=228.557, E = 65.000. The perpendicular bisectors of P′D and P′D′ intersect at N=118.557, E = 50.518 and the radius of the circle is 128.872.

Then the intersection of the two circles is N = 155.751, E = 173.906. (This can be carried to any precision needed.)