

## Problem 5—Olympic Hide And Seek Final

This time, Francisco Huron is going to beat the world's record and find Don Roberts no matter where he is hiding by placing an infrared emitter on Don. By standing in two different places with an infrared receiver, Francisco can determine Don's exact location by noting from which direction the emitter is broadcasting.

**INPUT SPECIFICATION.** Each data case consists of four floating point numbers separated by a space and followed by **<EOLN>**. The first is the distance in miles between the two receivers. The second is the direction angle from the first receiver to the second receiver. The third is the direction angle from the first receiver to the emitter. The fourth is the direction angle from the second receiver to the emitter. Direction angles are measured in degrees greater than or equal to 0 and less than 360, with 0 meaning east, 90 meaning north, 180 meaning west, and 270 meaning south. For example, if the angle from the first receiver to the second receiver is 45, that means that if you stand on the first receiver and face north-east, the second receiver is in your line of sight. The last data case is followed by “0 0 0 0**<EOLN>**”. This is not to be processed; it merely signifies the end of input.

**OUTPUT SPECIFICATION.** Each output case should appear in the same order as the corresponding input case. The output case should be “Case *c*: *a* miles from the first receiver and *b* miles from the second!**<EOLN><EOLN>**” where *c* is the case number and *a* and *b* represent the distance in miles from the emitter to each receiver, to the nearest tenth of a mile with exactly one digit following the decimal point.

### **SAMPLE INPUT.**

```
1.45 90 180<EOLN>
10.0 45 46<EOLN>
0.0 0 0<EOLN>
<EOF>
```

### **SAMPLE OUTPUT.**

```
Case 1: 0.7 miles from the first receiver and 0.7 miles from the second!<EOLN>
<EOLN>
Case 2: 412.2 miles from the first receiver and 405.2 miles from the second!<EOLN>
<EOLN>
<EOF>
```