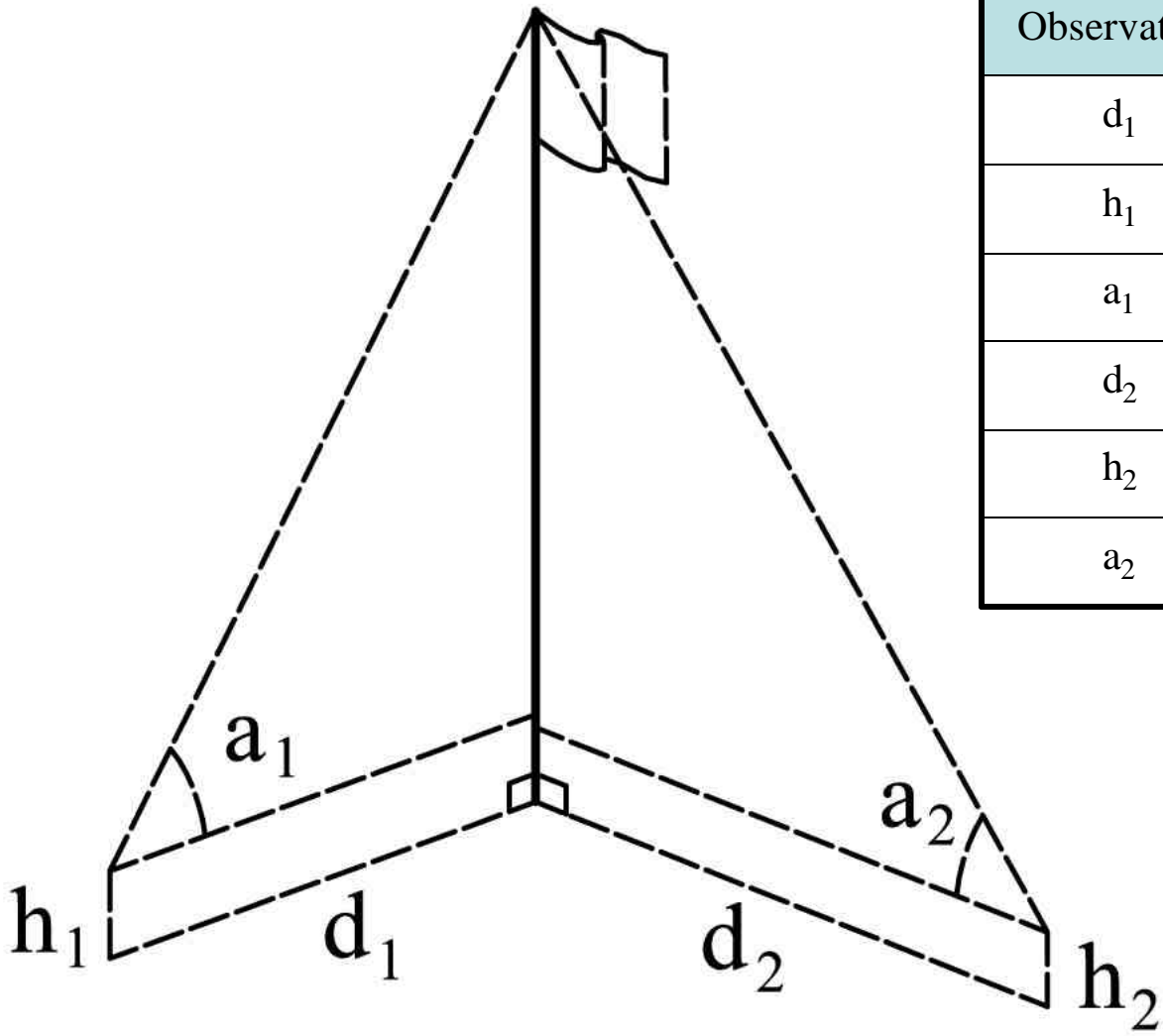
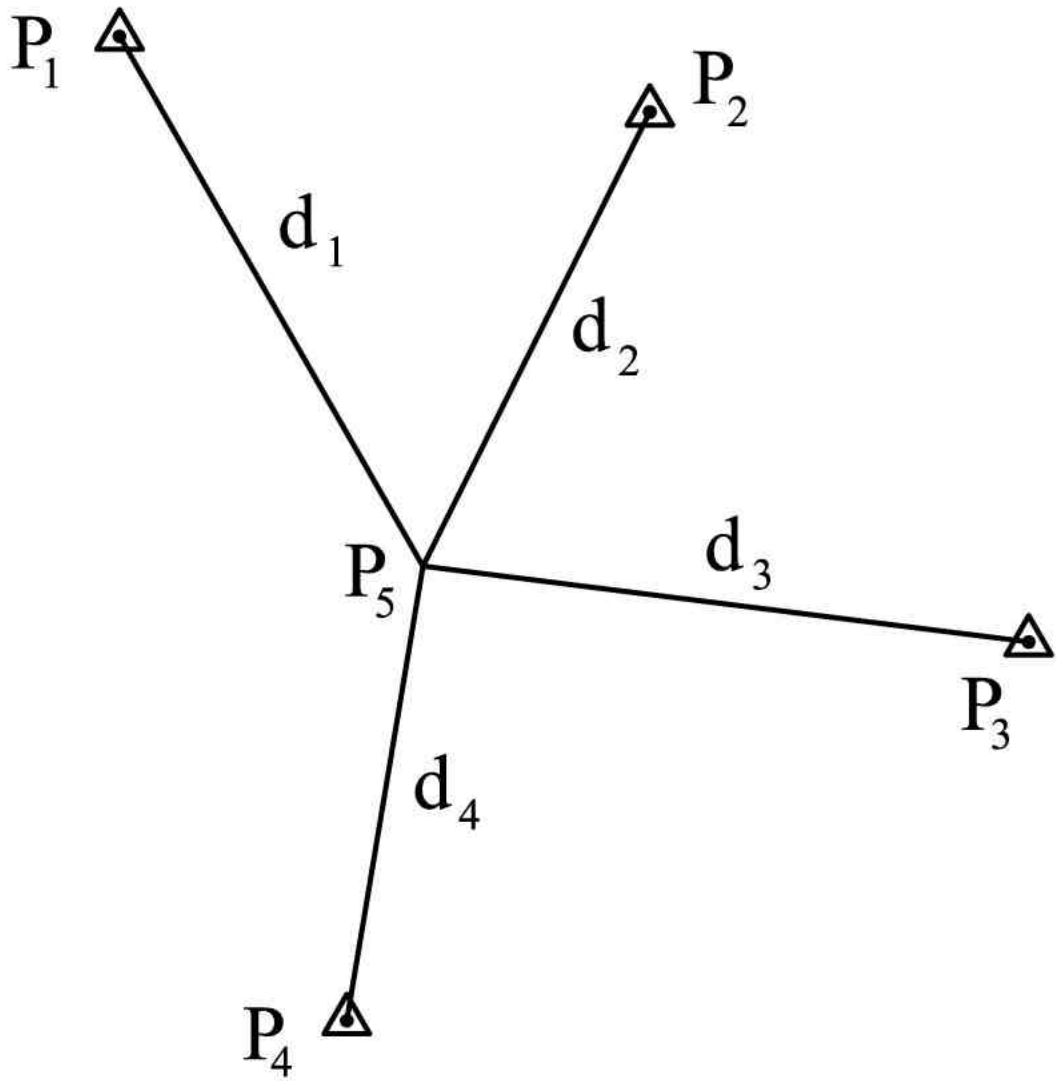


1. We wish to find the height of the flagpole. At stations 1 and 2 we observe the horizontal distance away,  $d$ , the height of the instrument,  $h$ , and the vertical angle,  $a$ . (a) Solve by observations only. (b) Solve by indirect observations. (Angles are deg-min., in both cases use the given sigmas.)



Observation	Value	Sigma
$d_1$	12.02	0.05
$h_1$	1.68	0.07
$a_1$	59-40	00-10
$d_2$	15.95	0.03
$h_2$	1.61	0.06
$a_2$	51-45	00-12

2. The horizontal distance to point 5 is observed from four known control points. Using the method of indirect observations, (a) determine the location of point 5, (b) determine its location assuming that point 5 falls exactly along the line:  $y = 0.5x + 60$ . (Note: for this, and any future assignments, you are welcome to check your work with Move3, StarNet, or any other adjustment application, but you will be evaluated on *your solution*.)



Point	X	Y
$P_1$	20.0	160.0
$P_2$	90.0	150.0
$P_3$	140.0	80.0
$P_4$	50.0	30.0

Observ.	Value	Sigma
$d_1$	80.3	0.3
$d_2$	67.0	0.3
$d_3$	79.7	0.3
$d_4$	60.6	0.3