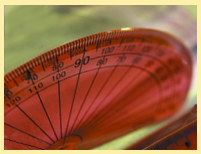
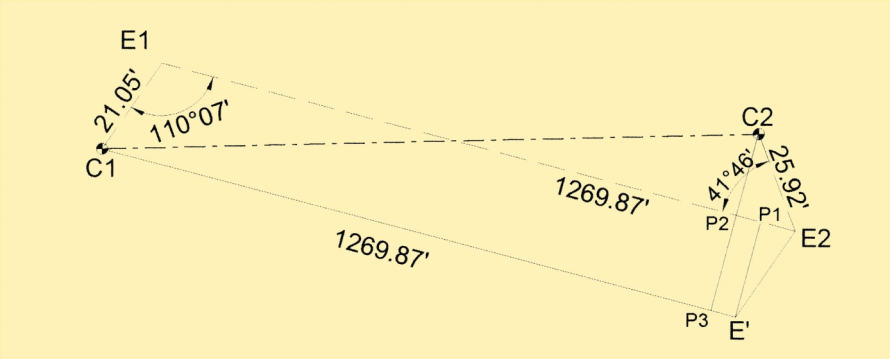


Solution to Problem Number 5



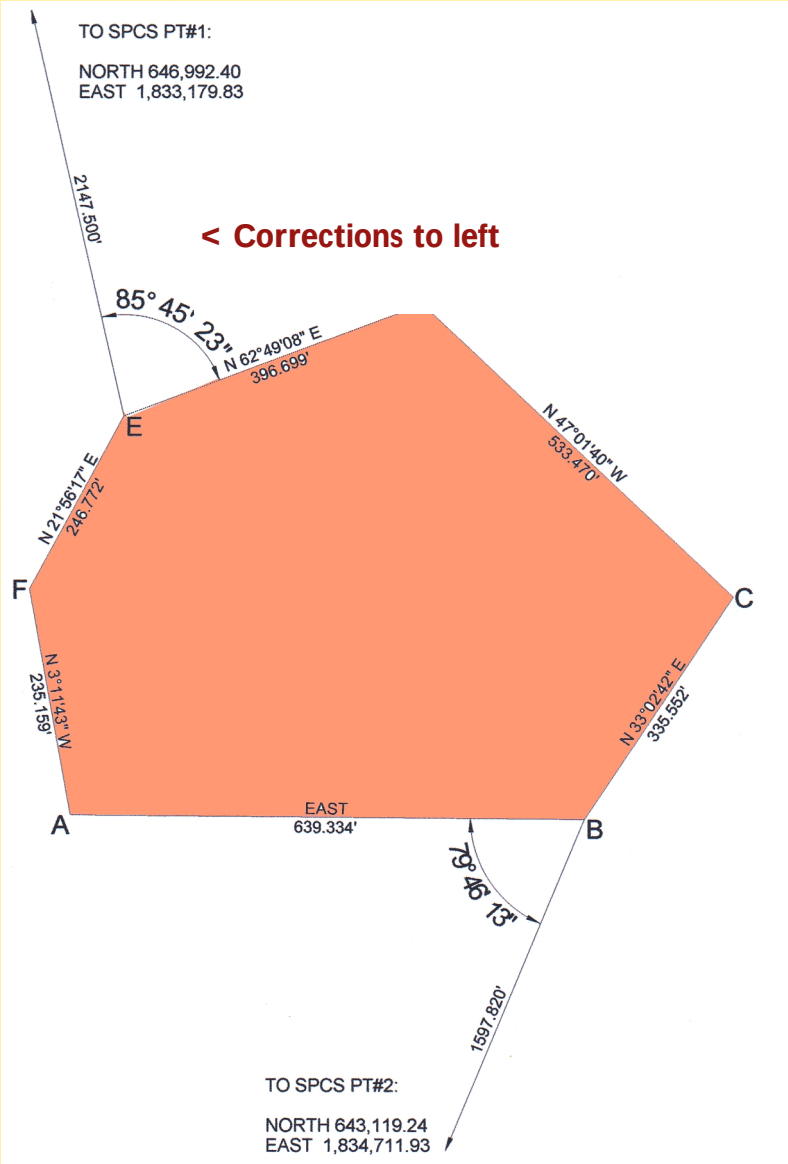
(A quick and easy solution is to assume E1-E2 as "East," assign an arbitrary coordinate to either point, calculate coordinates for the corners and inverse for the distance.)

Draw C1-E' parallel with E1-E2, draw E2-E' parallel with E1-C1.
Draw perpendiculars P1, P2, AND P3
Angle P1-E'-E2 = 20°07' Distance P1-E' = 21.05'
cos 20°07' = 19.766' = P2-P3
Distance P1-E2 = 21.05' sin 20°07' = 7.240'
Distance C2-P2 = 25.92' sin 41°46' = 17.265
Distance P2-E2 = 25.92' cos 41°46' = 19.333'
Distance P2-P1 = 19.33'-7.240' = 12.093'
C1-P3 = 1269.87'-12.093' = 1257.777'
C2-P3 = 17.265' + 19.766' = 37.031'
$(C1\text{-}C2)^2 = 1257.777^2 + 37.031^2$
C1-C2 = 1258.322'

Solution to Problem Number 6 (corrected)

Katrinka's traverse and ties yield coordinates of North 3441.395, East 2242.149 for SPCS#1 and North –572.420, East 3355.569 for SPCS#2. An inverse between these coordinates yields N15°30'14" W 4165.383', when in fact it is N21°34'56" W 4165.177'. The difference of 6°04'42" is what the traverse should be rotated and the quotient 4165.177 / 4165.383 will give the average scale and sea level factors of 0.9999950545. A rerun of the traverse with the rotated bearings and scaled distances must start with one of the SPCS points to translate it to the state plane coordinate system and should check into the other one:

POINT	BEARING	DISTANCE	NORTH	EAST
SPCS#2			643,119.24	1,834,711.93
	N4°09'05E	1597.741		
B			644,712.789	1,834,827.594
	N26°58'00"E	335.535		
C			645,011.841	1,834,979.749
	N53°06'22"W	533.444		
D			645,332.086	1,834,553.128
	S56°44'26"W	396.679		
E			645,114.535	1,834,221.427
	N29°00'57"W	2147.394		
SPCS#1			646,992.401	1,833,179.831
B			644,712.789	1,834,827.594
	S83°55'18"W	639.302		
A			644,645.094	1,834,191.886
	N9°16'25"W	235.147		
F			644,877.168	1,834,153.992
	N15°51'35"E	246.760		
E			645,114.535	1,834,221.427



The problems for this column are contributed by retired California surveyor Dave Lindell, LS.