



Assignment (8)

1. The cartesian coordinates of point A are (500, 200, 100). Calculate its polar coordinates (r, θ , ϕ). Answer (547.7, 79.48°, 21.8°)
2. Compute the cartesian coordinates of station P (X, Y, Z) if its polar coordinates (r, θ , ϕ) are (400, 30°, 65°) Answer (84.52, 181.26, 346.4) m
3. If the rotation angle between system1 and system2 is 30°, scale factor is 0.6, $T_x = 50$ m and $T_y = 150$ m. Compute the coordinates of the two points A and B in system2 if their coordinates in system1 are (100, 250) and (200, 423.205) respectively.
4. Given the coordinates of the corners of the polygon ABCD in two systems. Calculate the transformation parameters between the two systems then compute the unknown coordinates in the table.

Point	XY-System		UV-System	
	X	Y	U	V
A	100	250	?	?
B	200	423.205	?	?
C	286.602	373.205	310.884	257.942
D	157.735	150	176.962	180.622

5. If the coordinates of point (P) is (500,400,100) in a 3D coordinate system1. It requires to compute its coordinates in system2 if the scale factor between the two systems is 0.825, $R_x = 20^\circ$, $R_y = 30^\circ$, $R_z = 15^\circ$, $T_x = 100$ m, $T_y = 124$ m and $T_z = 35$ m.
6. Three common points are located in two Cartesian systems. Determine the transformation parameters between the two systems.

Point	XYZ-System			UVW-System		
	X	Y	Z	U	V	W
1	500	152.3	40.56	400	215.45	20.42
2	348.2	250.57	55.18	526.2	325.12	35.17
3	256.23	458.12	85.25	142.8	501.9	43.5