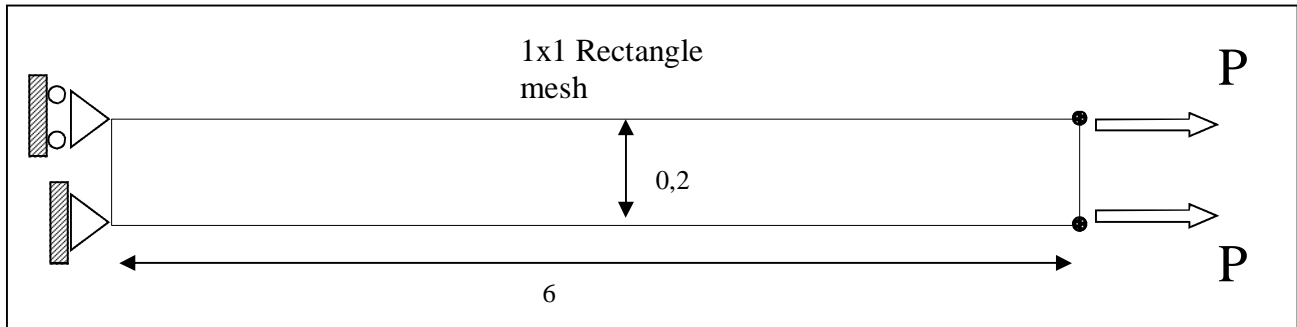


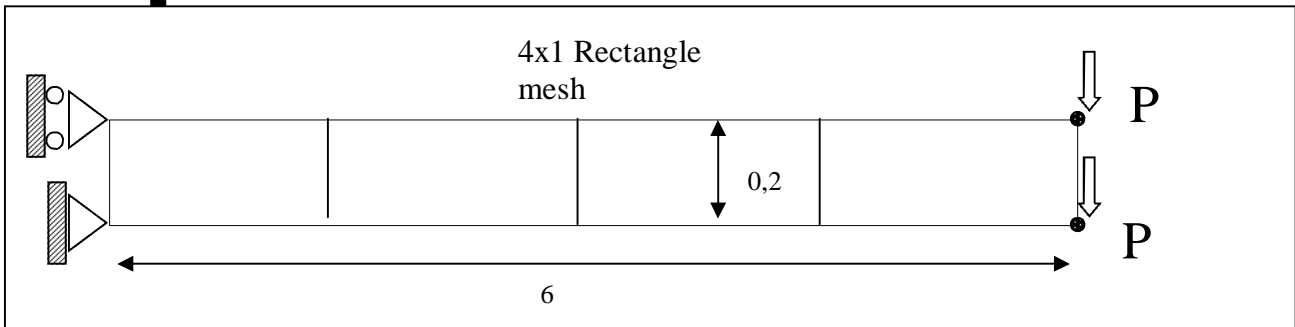
1-Straight Beam With Axial Extension



P	0,5
E	10000000
v	0,3
Thicknes	0,1

Rectangle Mesh	Results		% error		Theoretic
	STA	SAP2000	STA	SAP2000	
1X1	0,00003	0,00003	0,00	0,00	0,00003
Axial dispalacement					

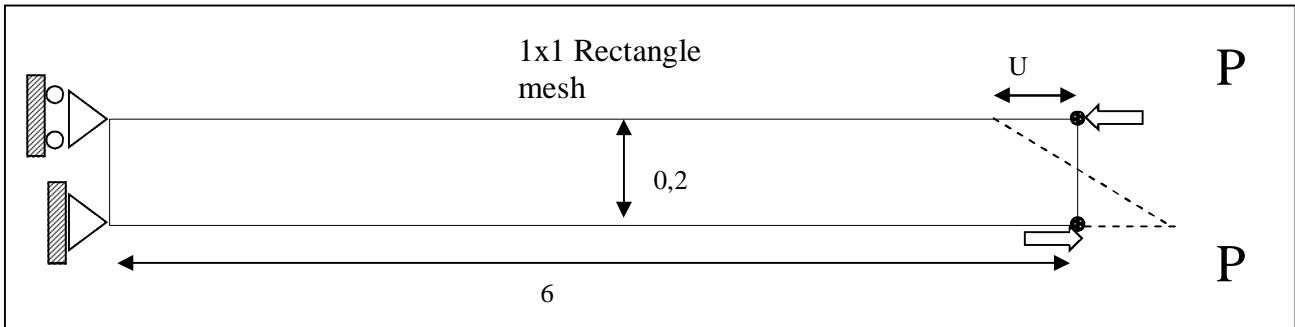
2-Straight Beam With In-plane shear and bending



P	0,5
E	10000000
v	0,3
Thicknes	0,1

Rectangle Mesh	Results		% error		Theoreti
	STA	SAP2000	STA	SAP2000	
1X1	0,0811	0,0811	-24,98	-24,98	0,1081
2x1	0,1013	0,1013	-6,29	-6,29	
3x1	0,1051	0,1051	-2,78	-2,78	
4x1	0,1064	0,1063	-1,57	-1,67	
5x1	0,1070	0,1069	-1,02	-1,11	
6x1	0,1073	0,1072	-0,74	-0,83	
Tip Deflection					

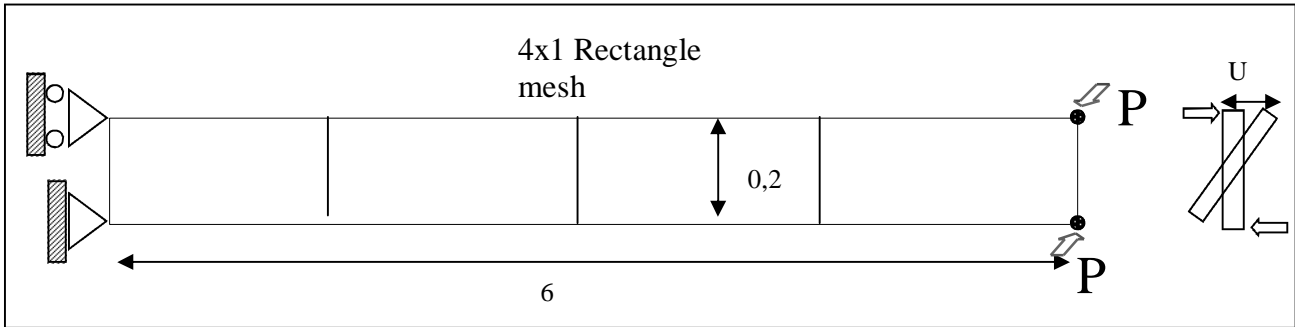
3-Straight Beam With In-Plane Moment



P	5
E	10000000
v	0,3
Thicknes	0,1

Rectangle Mesh	Results		% error		Theoreti
	STA	SAP2000	STA	SAP2000	
1X1	0,0009	0,0009	0,00	0,00	0,0009
U					

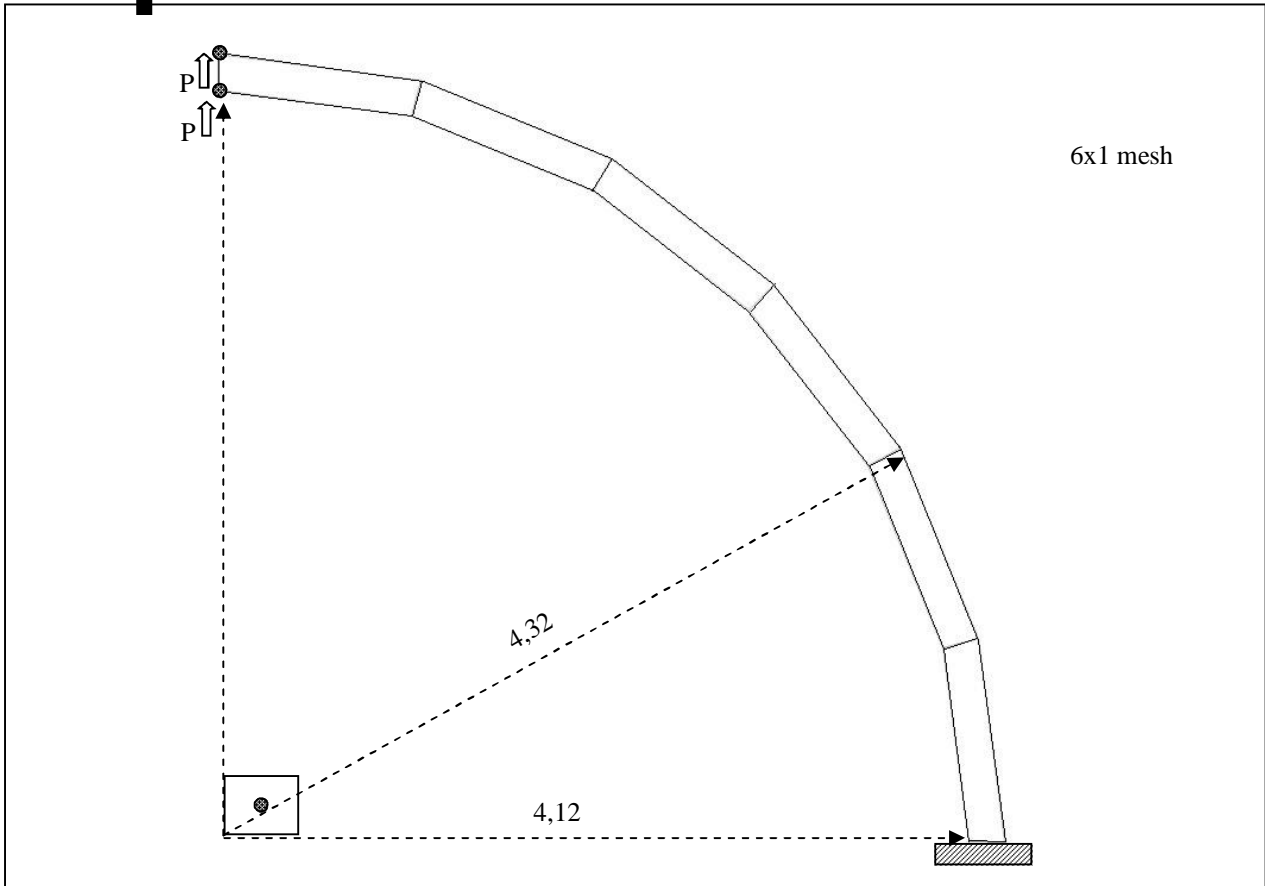
4-Straight Beam Twist



P	0,5
E	10000000
v	0,3
Thicknes	0,1

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
1X1	0,0022	0,0023	0,0018	-35,29	-32,35	-47,06	0,0034
2x1	0,0023	0,0023	0,0020	-32,35	-32,35	-41,18	
4x1	0,0023	0,0023	0,0022	-32,35	-32,35	-35,29	
8x1	0,0023	0,0023	0,0023	-32,35	-32,35	-32,35	
16x1	0,0024	0,0023	0,0023	-29,41	-32,35	-32,35	
32x1	0,0025	0,0023	0,0024	-26,47	-32,35	-29,41	
U							

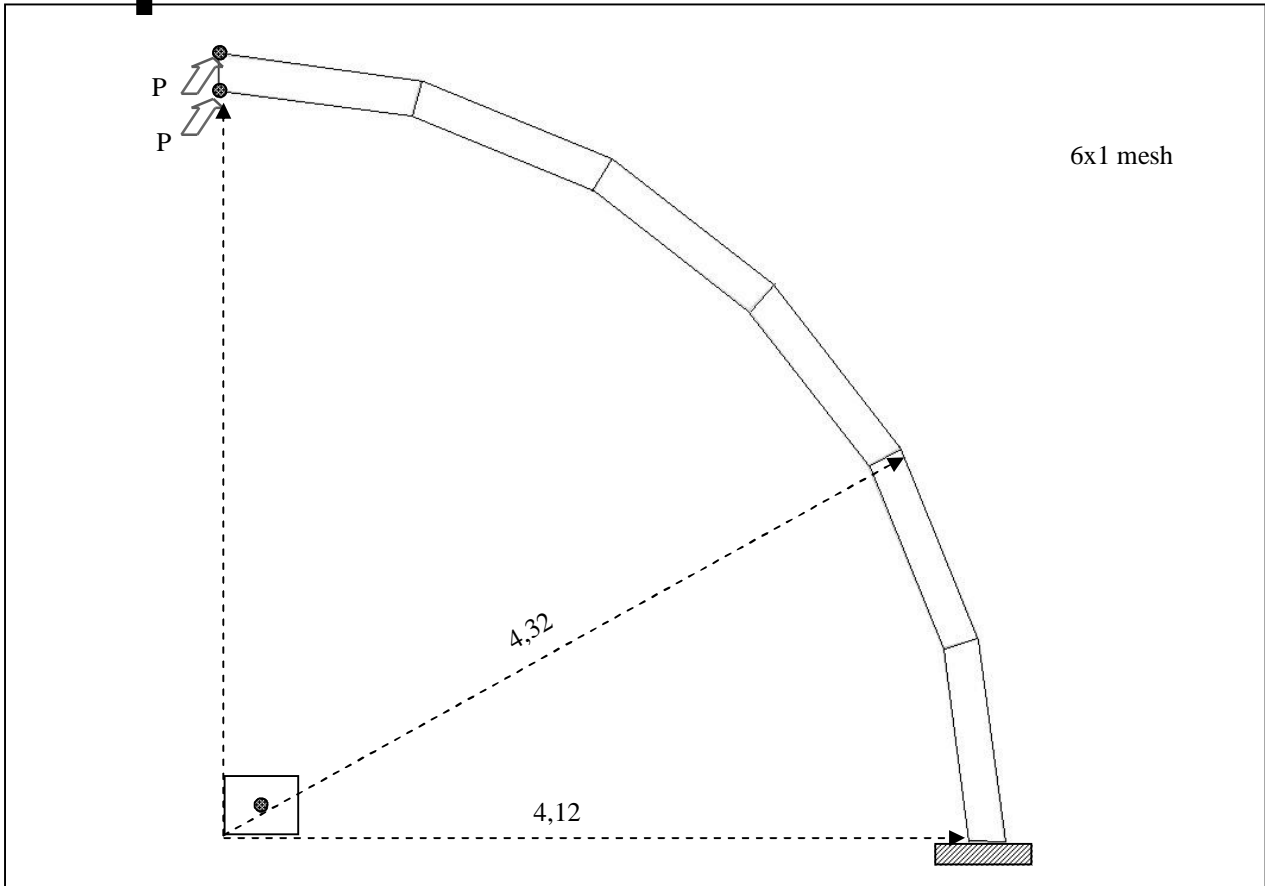
5-CURVED BEAM WITH In-Plane



P	0,5
E	10000000
v	0,25
Thicknes	0,1

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
6x1	0,0775	0,0773	0,0773	-12,53	-12,75	-12,75	0,0886
20x1	0,0883	0,0877	0,0877	-0,34	-1,02	-1,02	
Tip Deflection							

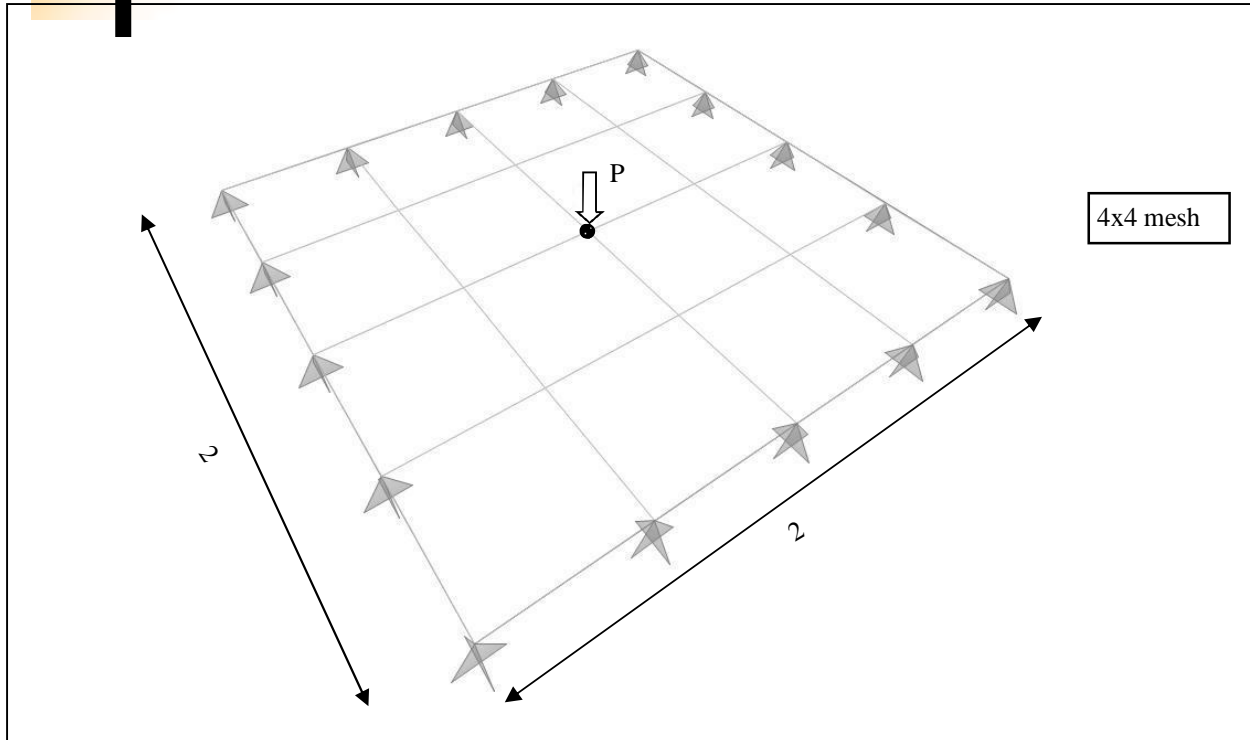
6-CURVED BEAM WITH Out-of-Plane



P	0,5
E	10000000
v	0,25
Thicknes	0,1

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
6x1	0,4437	0,4535	0,4298	-11,33	-9,37	-14,11	0,5004
20x1	0,4539	0,4524	0,4499	-9,29	-9,60	-10,09	
Out of plane tip deflection							

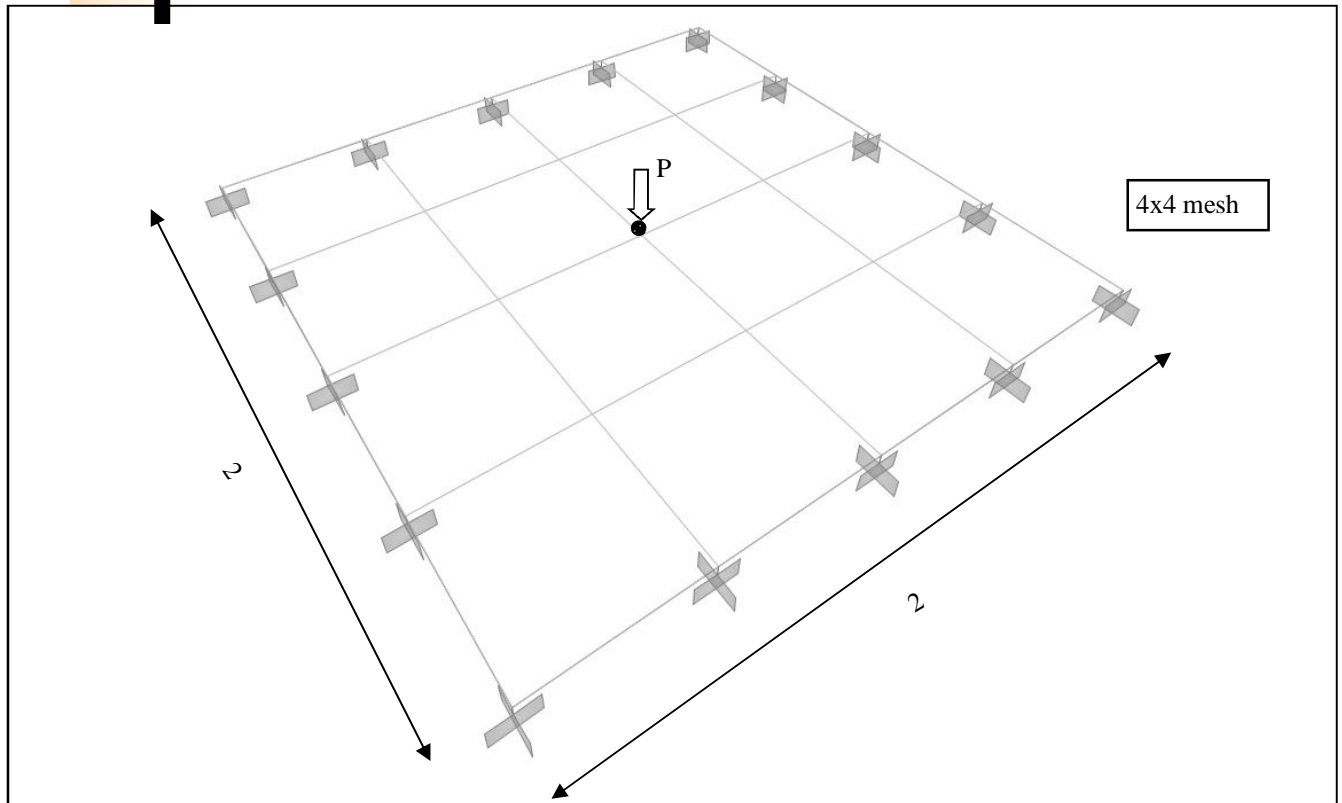
7-SIMPLY SUPPORTED RECTANGULAR PLATE WITH POINT LOADS



P	0,0004
E	17472000
ν	0,3
Thicknes	0,0001

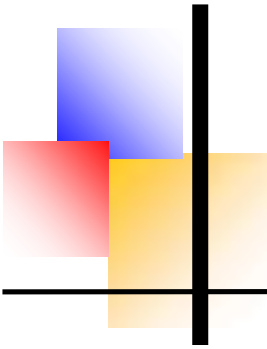
Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	13,04	15,16	12,20	12,41	30,69	5,17	11,60
4x4	12,06	12,69	11,68	3,97	9,40	0,69	
8x8	11,74	11,94	11,60	1,21	2,93	0,00	
16x16	11,64	11,70	11,61	0,34	0,86	0,09	
32x32	11,61	11,63	11,61	0,09	0,26	0,09	
Central deflection							

8-SIMPLY SUPPORTED RECTANGULAR PLATE WITH POINT LOADS

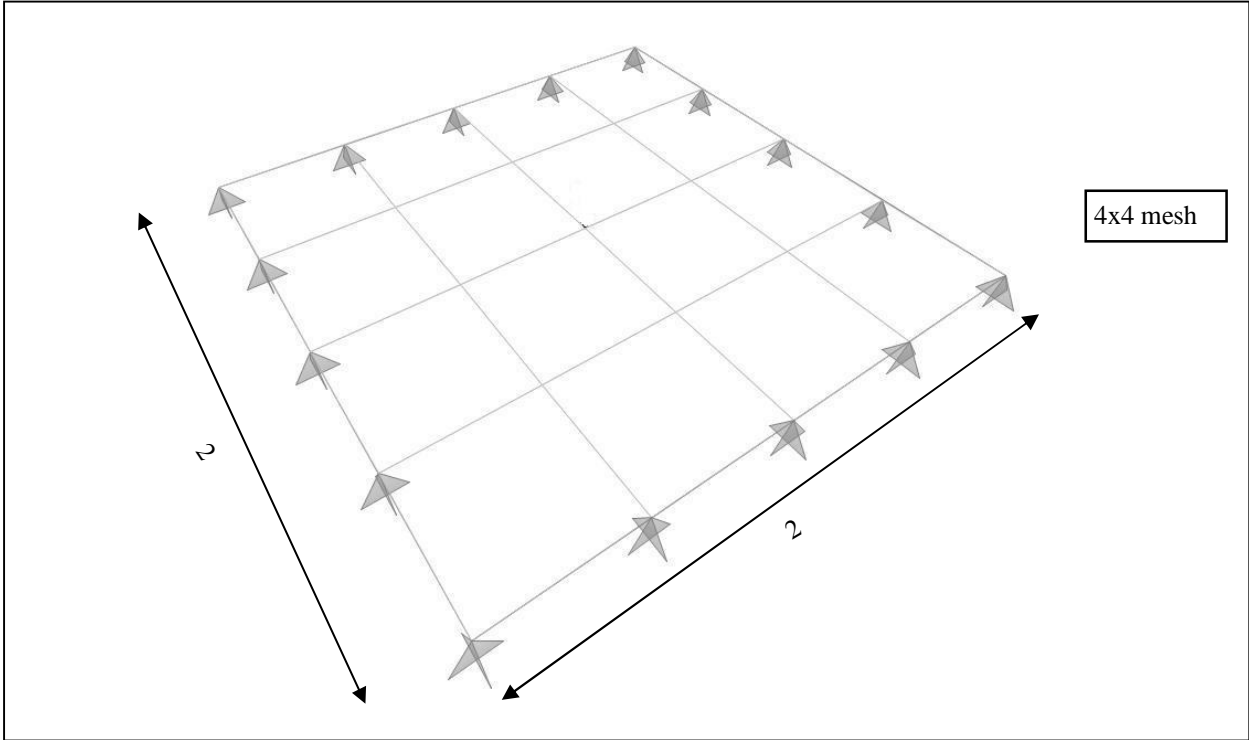


P	0,0004
E	17472000
ν	0,3
Thicknes	0,0001

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	5,93	6,25	0,07	5,89	11,61	-98,71	5,60
4x4	5,98	6,41	4,67	6,79	14,46	-16,61	
8x8	5,74	5,90	5,38	2,50	5,36	-3,93	
16x16	5,65	5,70	5,58	0,89	1,79	-0,36	
Central deflection							



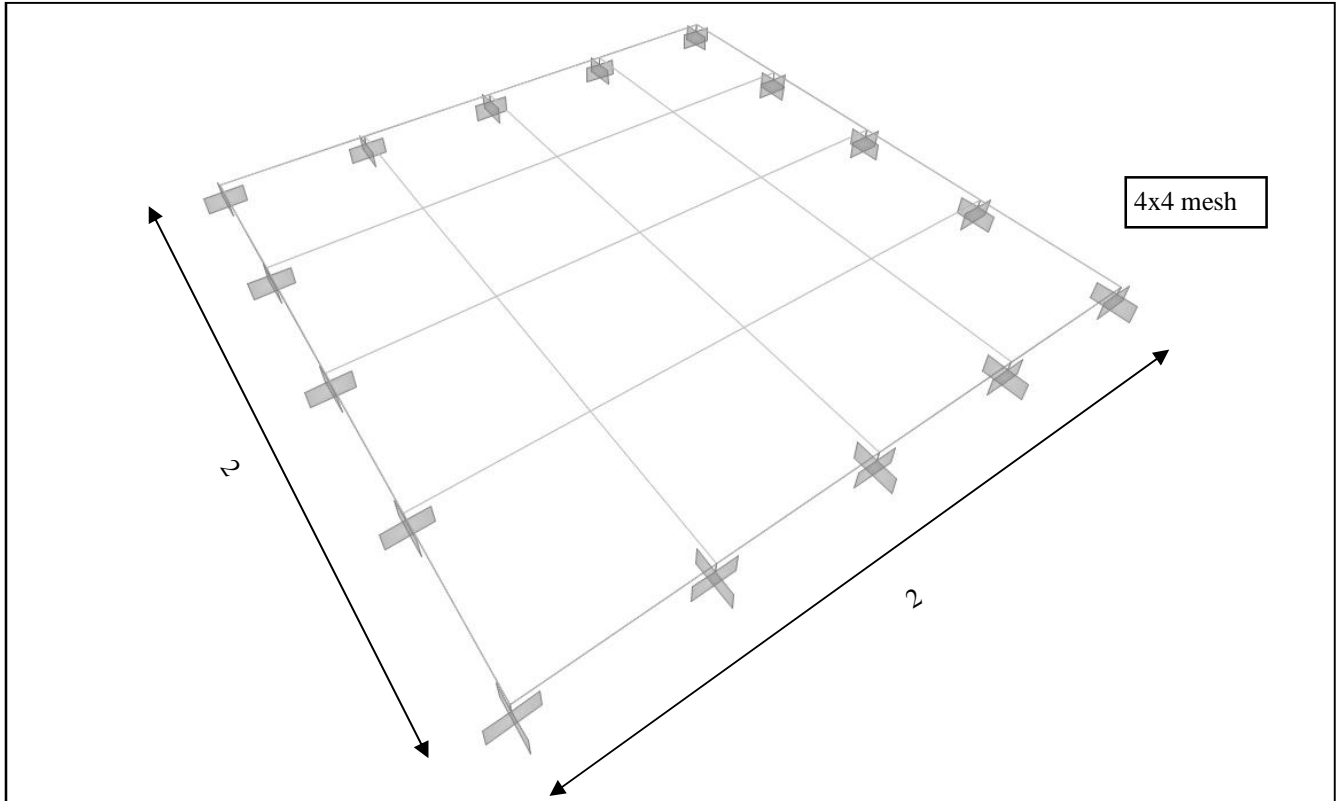
9-CLAMPED RECTANGULAR PLATE WITH GRAVITY LOADS



Birim Hacim Ağırlık	1
E	17472000
ν	0,3
Thickness	0,0001

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	3,26	3,79	3,05	-19,70	-6,65	-24,88	4,06
4x4	3,84	4,05	3,93	-5,42	-0,25	-3,20	
6x6	3,96	4,06	4,01	-2,46	0,00	-1,23	
8x8	4,00	4,06	4,03	-1,48	0,00	-0,74	
16x16	4,05	4,06	4,06	-0,25	0,00	0,00	
Central deflection							

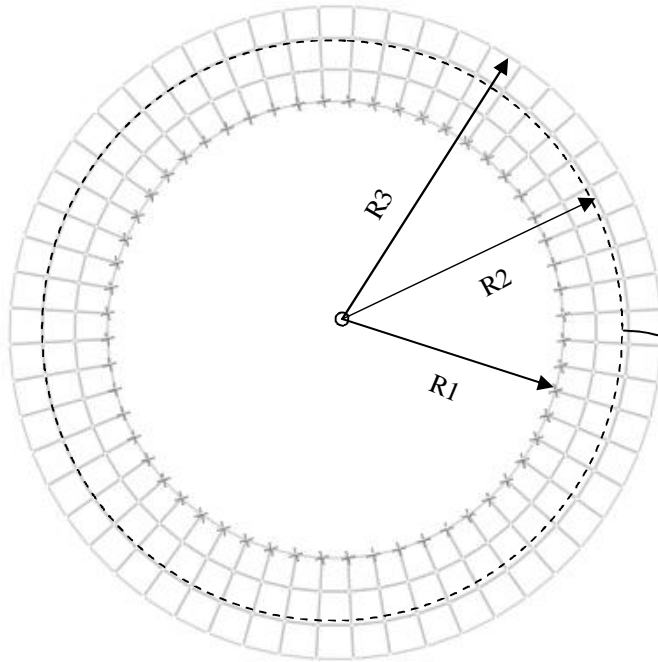
10-CLAMPED RECTANGULAR PLATE WITH GRAVITY LOADS



Birim Hacim Ağırlık	1
E	17472000
ν	0,3
Thickness	0,0001

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	1,48	1,56	0,02	17,46	23,81	-98,57	1,26
4x4	1,36	1,46	1,16	7,94	15,87	-7,94	
6x6	1,31	1,36	1,23	3,97	7,94	-2,38	
8x8	1,29	1,32	1,25	2,38	4,76	-0,79	
16x16	1,27	1,28	1,27	0,79	1,59	0,79	
Central deflection							

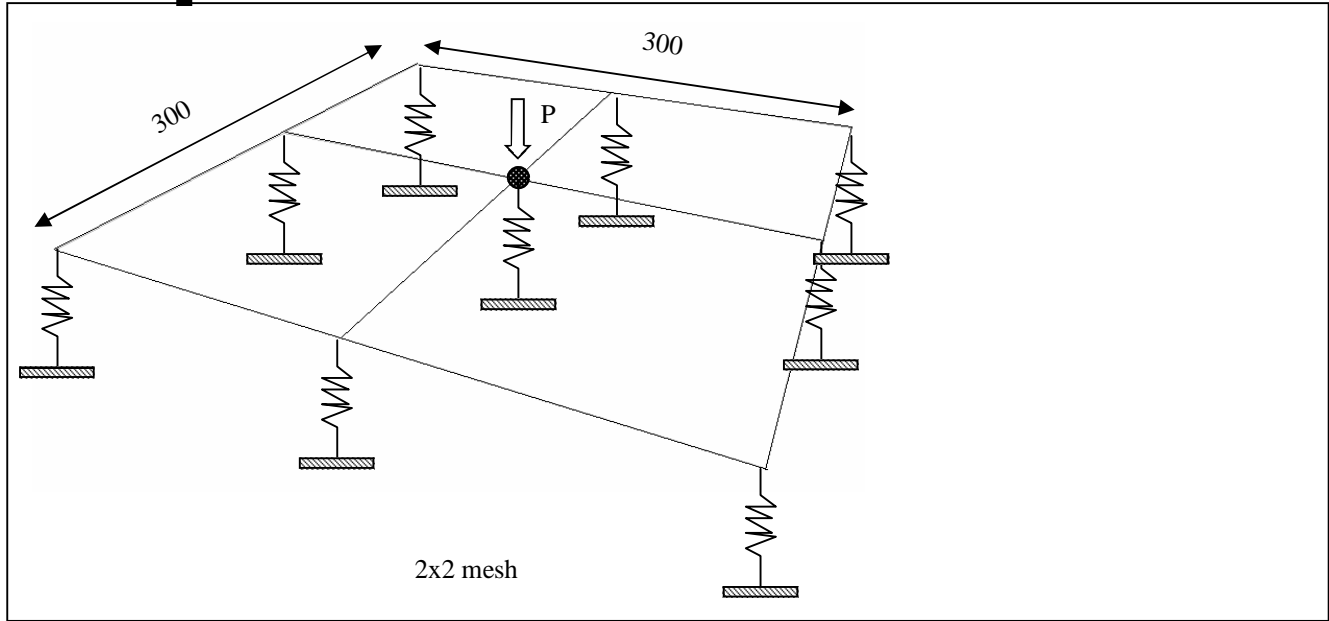
11-PLATE BENDING WHEN SHEAR DEFORMATIONS ARE SIGNIFICANT



E	18000000
ν	0,3
Thickness	0,5
R1	1,4
R2	1,8
R3	2

Rectangle Mesh	Results			% error			Theoretic (Kayma gerilmeleri dahil)
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
0,2 mesh	0,00531	0,00522	0,00534	-0,56	-2,25	0,00	0,00534
0,1 mesh	0,00534	0,00522	0,00534	0,00	-2,25	0,00	
Deflection of points which on R3							

12-PLATE ON ELASTIC FOUNDATION



P	50
E	29000
v	0,3
Thickness	1
k (zemin yatak katsayısı)	0,462963 ve 0,017360

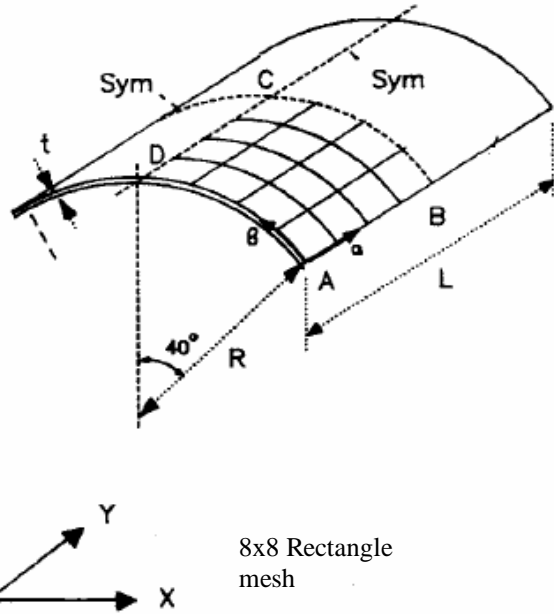
Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	0,1273	0,1274	0,1272	-86,17	-86,16	-86,18	0,9205
4x4	0,4515	0,4559	0,4069	-50,95	-50,47	-55,80	
8x8	0,8637	0,8851	0,6902	-6,17	-3,85	-25,02	
16x16	0,9334	0,9496	0,8576	1,40	3,16	-6,83	
32x32	0,9295	0,9354	0,9164	0,98	1,62	-0,45	
40x40	0,9279	0,9315	0,9222	0,80	1,20	0,18	

k=0,017360 Central deflection

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	0,0048	0,0048	0,0048	-97,31	-97,31	-97,31	0,1782
4x4	0,0191	0,0191	0,0190	-89,28	-89,28	-89,34	
8x8	0,0709	0,0713	0,0601	-60,21	-59,99	-66,27	
16x16	0,1586	0,1620	0,1241	-11,00	-9,09	-30,36	
32x32	0,1813	0,1840	0,1676	1,74	3,25	-5,95	
40x40	0,1818	0,1836	0,1743	2,02	3,03	-2,19	

k=0,462963 Central deflection

13-SCORDELIS-LO ROOF WITH GRAVITY LOADS-1



simply supported (U_x and U_z restrained) at its curved ends and is free along the straight edges

Birim Hacim Ağırlık	360
E	432000000
ν	0
Thickness(t)	0,25
L	50
R	25

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	1,1233	1,3658	1,0502	264,00	342,58	240,31	0,3086
4x4	0,4015	0,4207	0,4122	30,10	36,33	33,57	
8x8	0,3135	0,3169	0,3160	1,59	2,69	2,40	
12x12	0,3053	0,3068	0,3073	-1,07	-0,58	-0,42	

Deflection of point B

Üçgen Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	0,018	0,018	0,018	-62,50	-62,50	-62,50	0,048
4x4	0,057	0,061	0,058	18,75	27,08	20,83	
8x8	0,047	0,048	0,048	-2,08	0,00	0,00	
12x12	0,046	0,046	0,046	-4,17	-4,17	-4,17	

Deflection of point C

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	2694	3217	4306	110,49	151,33	236,41	1280
4x4	1685	1749	1968	31,65	36,64	53,75	
8x8	1302	1327	1340	1,75	3,67	4,69	
12x12	1245	1261	1255	-2,75	-1,48	-1,95	
32x32	1208	1216	1184	-5,66	-5,00	-7,50	

Twisting moment of point A (M_{xy})

13-SCORDELIS-LO ROOF WITH GRAVITY LOADS-2

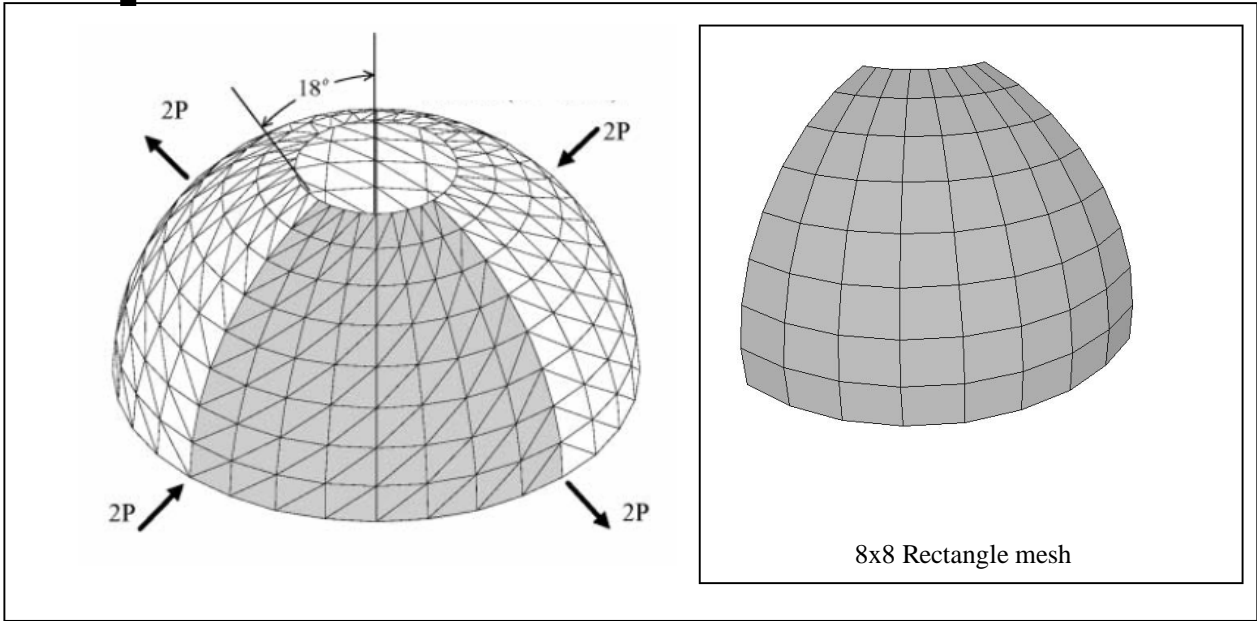
Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	2727	4163	2041	289,55	494,71	191,57	700
4x4	875	769	928	25,00	9,86	32,57	
8x8	700	694	694	0,00	-0,86	-0,86	
12x12	665	670	676	-4,93	-4,29	-3,43	
32x32	648	652	655	-7,48	-6,86	-6,43	
Longitudinal moment of point B (Mx)							

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	-791	38	53	690,55	-138,00	-153,00	-100
4x4	-337	-125	-120	237,20	25,00	20,00	
8x8	-165	-107	-105	65,39	7,00	5,00	
12x12	-127	-100	-104	27,04	0,00	4,00	
32x32	-100	-96	-98	0,35	-4,00	-2,00	
Longitudinal moment of point C (Mx)							

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	1777	457	-2068	-4542,22	-1242,50	5070,00	-40
4x4	284,8	-7,2	-302,0	-811,97	-82,08	655,00	
8x8	98,8	-0,1	45,0	-346,90	-99,79	-212,50	
12x12	64,0	0,0	92,0	-259,97	-100,00	-330,00	
32x32	23,6	0,0	59,0	-159,02	-100,00	-247,50	
Transverse moment of point B (My)							

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	-6311	-8505	-5300	203,41	308,89	154,81	-2080
4x4	-2525	-2657	-2430	21,38	27,74	16,83	
8x8	-2131	-2162	-2116	2,46	3,94	1,73	
12x12	-2086	-2099	-2097	0,28	0,91	0,82	
32x32	-2061	-2062	-2068	-0,90	-0,87	-0,58	
Transverse moment of point C (My)							

14-HEMISPHERICAL SHELL STRUCTURE WITH STATIC LOADS

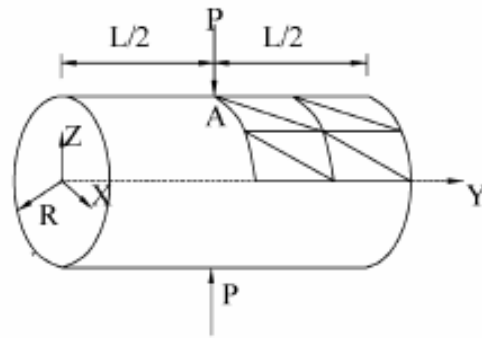


P	1
E	68250000
v	0,3
Küre Yarıçapı	10

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	0,0924	0,0276	0,0244	-1,68	-70,64	-74,04	0,0940
4x4	0,0949	0,0884	0,0844	0,99	-5,96	-10,21	
8x8	0,0949	0,0939	0,0927	0,91	-0,11	-1,38	
16x16	0,0946	0,0935	0,0934	0,66	-0,53	-0,64	
Thickness 0,04 Displacement in the direction of the point load							

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	5381	540	289	-7,83	-90,75	-95,05	5838
4x4	1721	62	59	-70,52	-98,94	-98,99	
8x8	1533	806	792	-73,75	-86,19	-86,43	
16x16	4593	4196	4177	-21,32	-28,13	-28,45	
24x24	5542	5422	5407	-5,06	-7,13	-7,38	
Thickness 0,001 Displacement in the direction of the point load							

15-Cylindrical Shell With Points Load

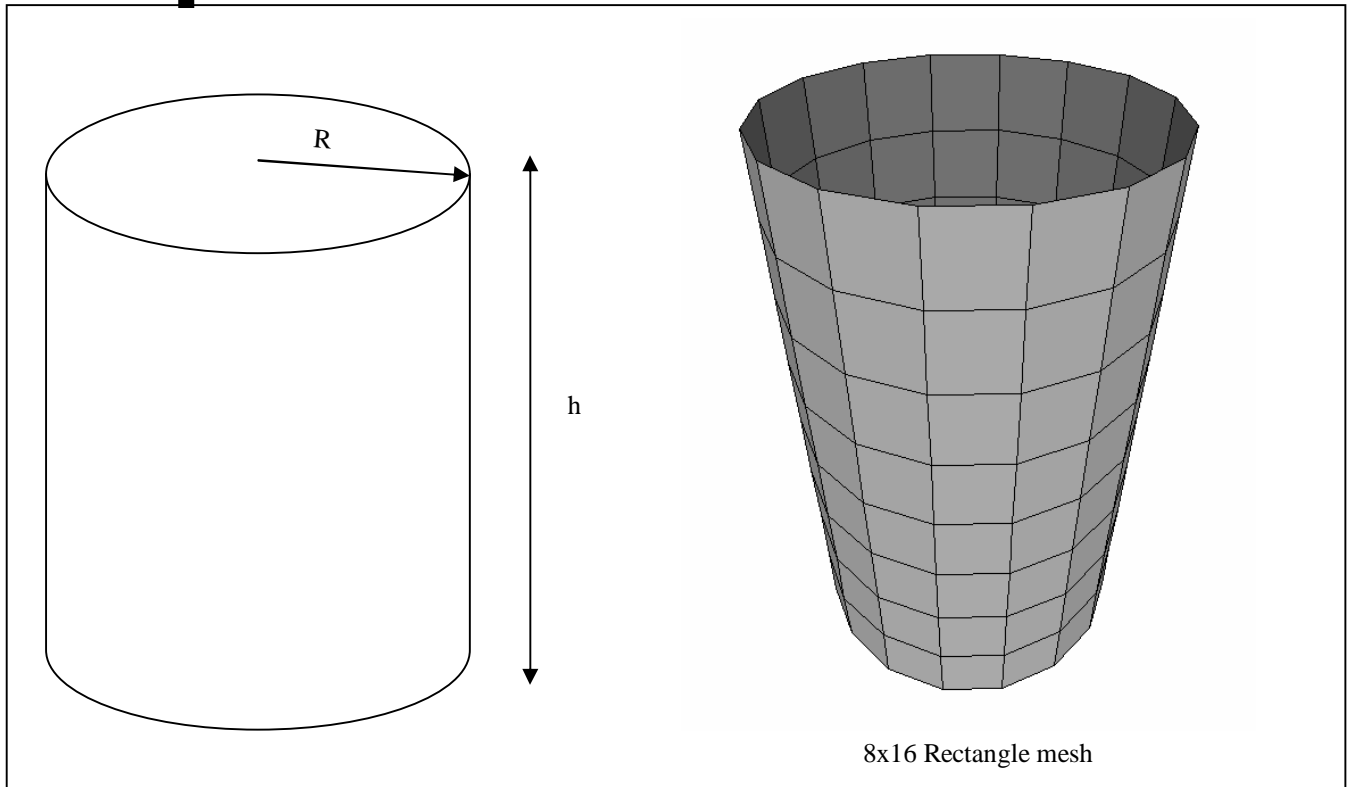


2x2 Rectangle mesh

P	100
E	105000000
ν	0,3125
Thickness	0,094
L	10,35
R	4,953

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
2x2	0,0956	0,0976	0,0976	-16,10	-14,28	-14,33	0,1139
4x4	0,1080	0,1086	0,1076	-5,21	-4,70	-5,53	
6x6	0,1113	0,1117	0,1107	-2,28	-1,98	-2,81	
8x8	0,1125	0,1127	0,1121	-1,24	-1,05	-1,58	
Displacement in the direction of the point load							

16-CYLINDER WITH INTERNAL PRESSURE



P(internal pressure)	1
E	29000
v	0,3
Thickness	1
h	200
R	60

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
8x16	0,12175	0,12175	0,12175	-1,93	-1,93	-1,93	0,12414
Radial displacement							

Rectangle Mesh	Results			% error			Theoretic
	STA	SAP2000 (thin)	SAP2000 (thick)	STA	SAP2000 (thin)	SAP2000 (thick)	
8x16	-0,12175	-0,12175	-0,12175	1,93	1,93	1,93	-0,12414
Longitudinal total displacement							