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**Variables Sheet**

Input	Name	Output	Unit	Comment
				<b>Roark's Formulas</b>
				<b>for Stress and Strain</b>
				<b>Table 24 Case 9 - Solid circular plate</b>
				<b>with uniform annular line load. Pg 428</b>
80	w		lbf/in	Line Load
3	r0		in	Radius to annular line load
	case	'Case_9b		Reference number
	caution1	'_		Caution Messages
	caution2	'_		
	caution3	'_		
17	matnum			Material Number (See Material Table)
	matl	'Steel_ASTM_A7_61T_all		Material name
'y	plot			Generate plots? 'n=no (Default=yes)
	E	2.9E7	psi	Young's Modulus
	nu	.27		Poisson's ratio
7	a		in	Outer Radius
.125	t		in	Plate Thickness
	D	5091.201	lbf-in	Plate Constant
				<b>AT RADIUS:</b>
0	r		in	Radius
	y	-.1458318	in	Deflection
	th	0	rad	Radial Slope Angle
	Mr	66.924	lbf-in/in	Radial Bending Moment
	Mt	66.924	lbf-in/in	Tangential Bending Moment
	Qr	0	lbf/in	Shear Force
	sigma_r	25698.859	psi	Radial Bending Stress
	sigma_t	25698.859	psi	Tangential Bending Stress
				<b>AT OUTER EDGE:</b>
	ya	0	in	Deflection
	tha	0	rad	Radial Slope Angle
	Mra	-97.959	lbf-in/in	Radial Bending Moment

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Input	Name	Output	Unit	Comment
	Qa	'No_data	lbf/in	Shear Force
				<b>AT CENTER:</b>
	yc	-.1458318	in	Deflection
	Mc	66.924	lbf-in/in	Radial Bending Moment

### Rules Sheet

#### Rules

if  $(r0 < 0, r0 \geq a, a \leq 0)$  then caution1 = 'Dim\_Err else caution1 = '\_

if  $t > \frac{a}{2}$  then caution2 = 't\_Thick else caution2 = '\_

$$D = \frac{E \cdot \left[ \begin{matrix} 3 \\ t \end{matrix} \right]}{12 \cdot \left[ 1 - \nu^2 \right]}$$

call get\_tab(matnum, matl, E, nu)

call case(a, D, nu, r0, r; ya, Mra, Qa, tha, yc, Mc, case)

call load(nu, r0, a, r, D, Mra, tha, Qa, ya, yc, Mc; y, th, Mr, Mt, Qr)

$$\sigma_r = \frac{6 \cdot Mr}{t^2}$$

$$\sigma_t = \frac{6 \cdot Mt}{t^2}$$

call clear()

plot = given('plot, plot, 'y)

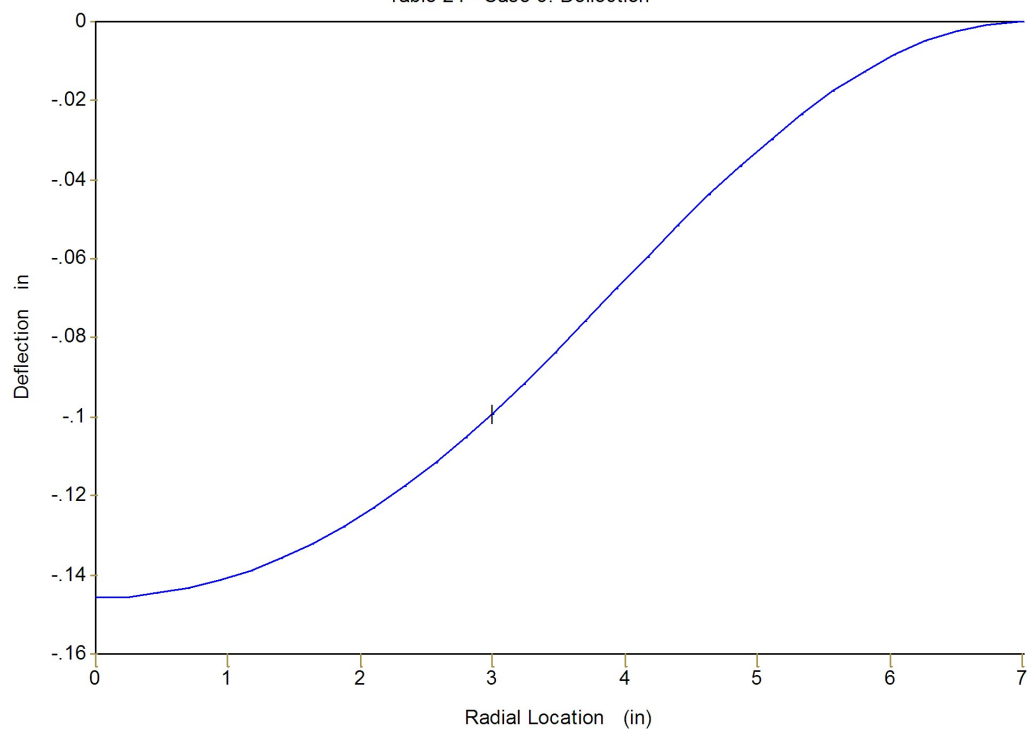
if and(solved(), plot < > 'n) then call genplot()

if  $r0 < .5 \cdot t$  then caution3 = 'See\_C\_17 else caution3 = '\_

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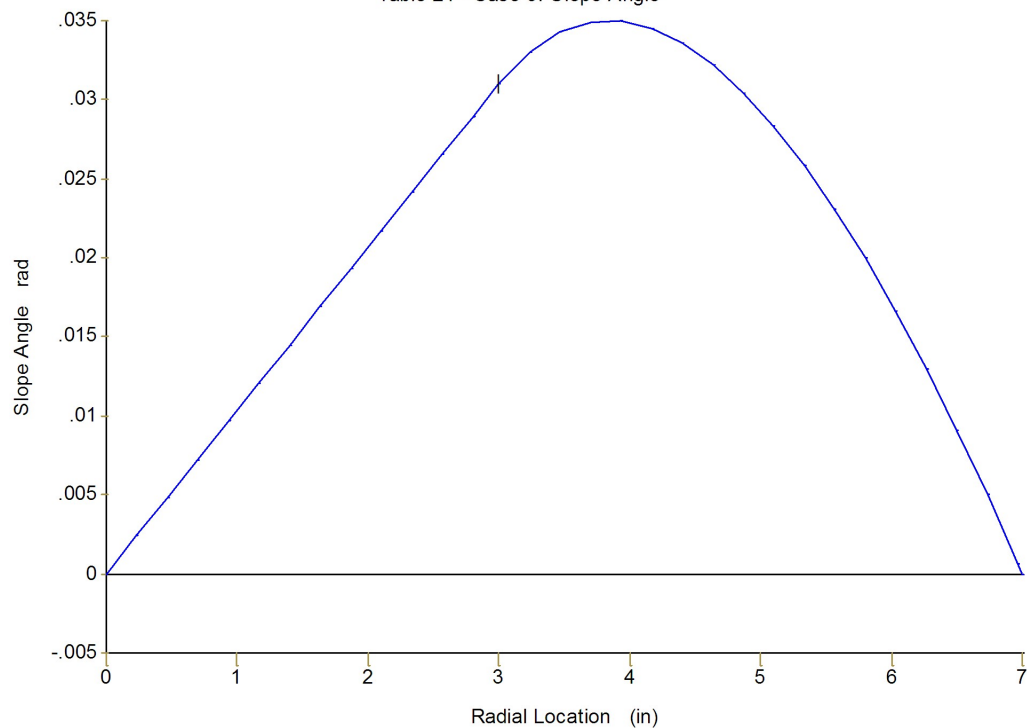
Plot: Deflection

Table 24 - Case 9: Deflection



Plot: Slope

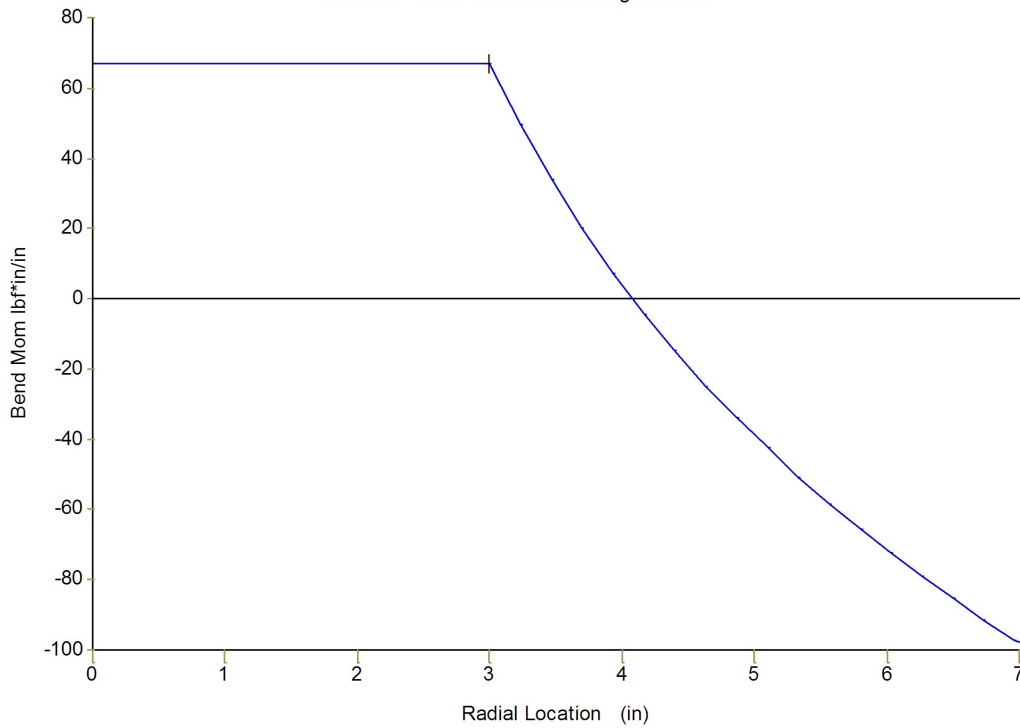
Table 24 - Case 9: Slope Angle



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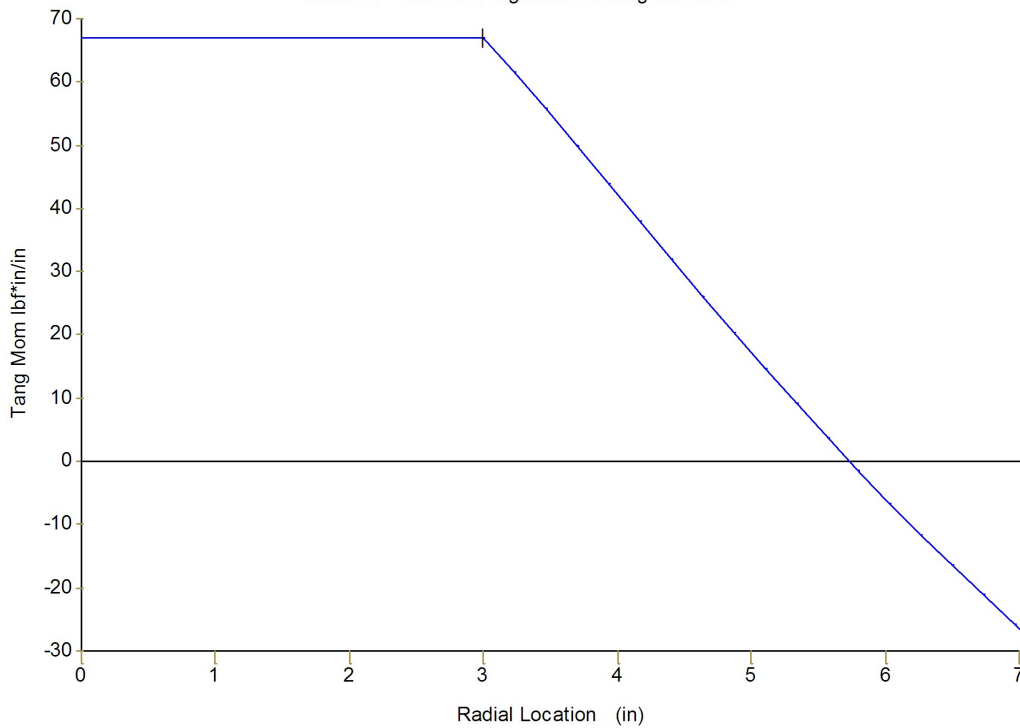
Plot: Rad\_Bend\_moment

Table 24 - Case 9: Radial Bending Moment



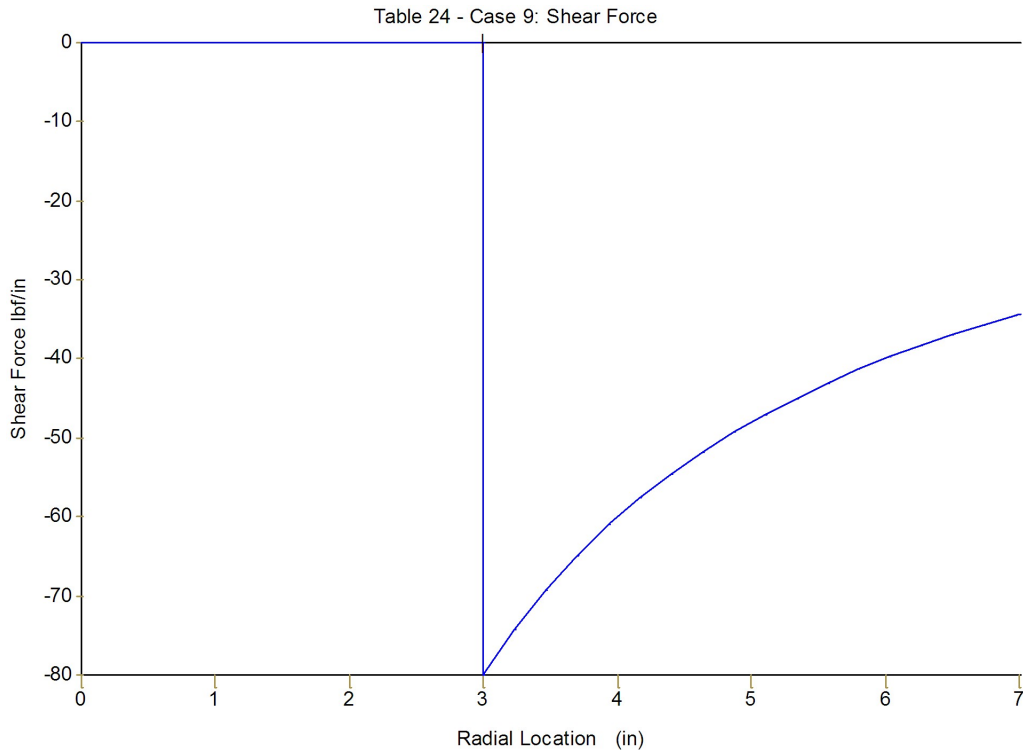
Plot: Tan\_Bend\_Moment

Table 24 - Case 9: Tangential Bending Moment

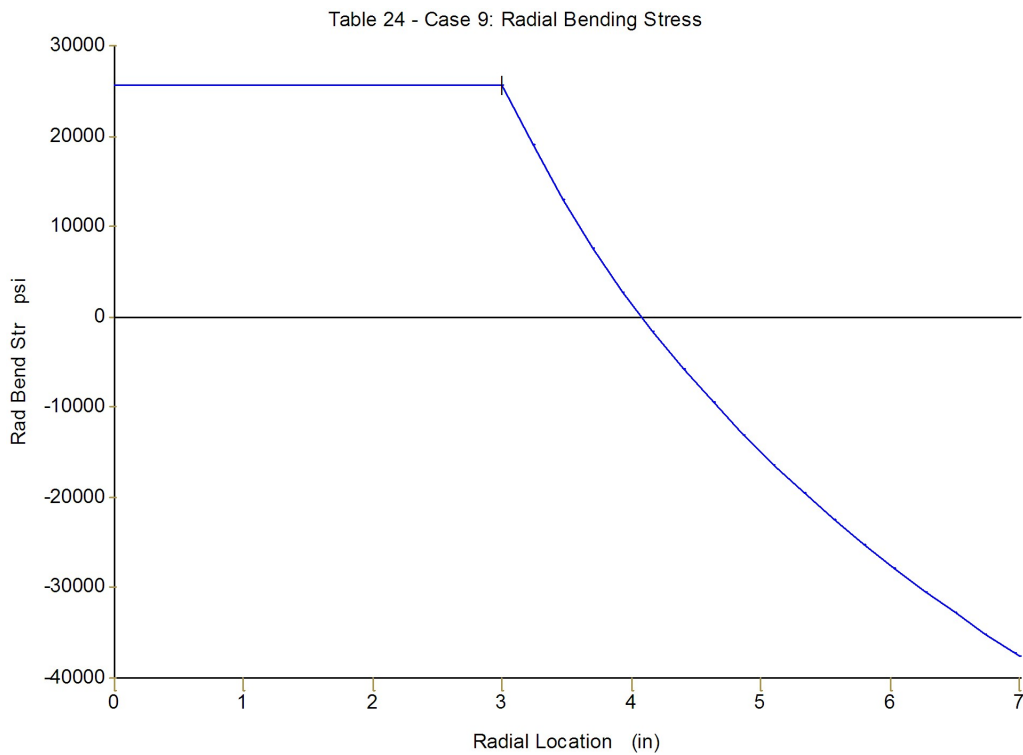


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Plot: Shear\_force



Plot: Rad\_Stress



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Plot: Tan\_Stress

Table 24 - Case 9: Tangential Bending Stress

