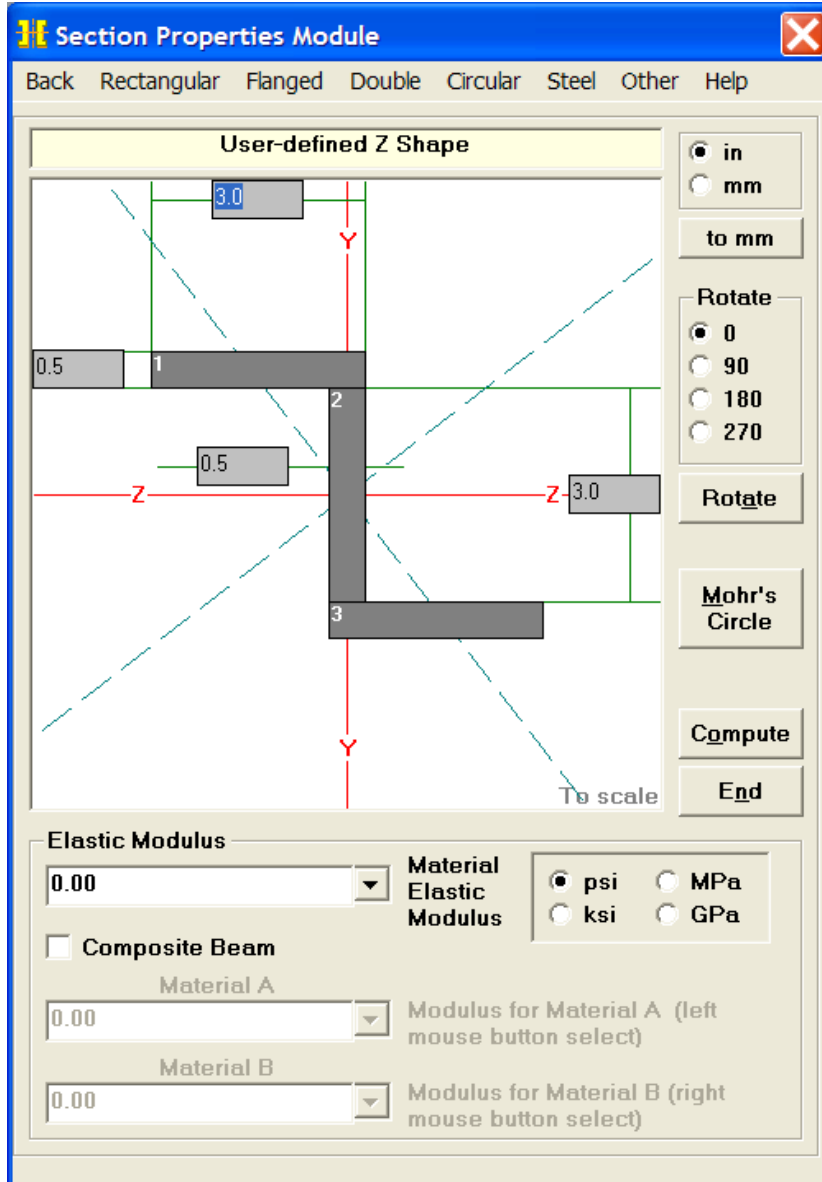


Example 12.8-5



Note:

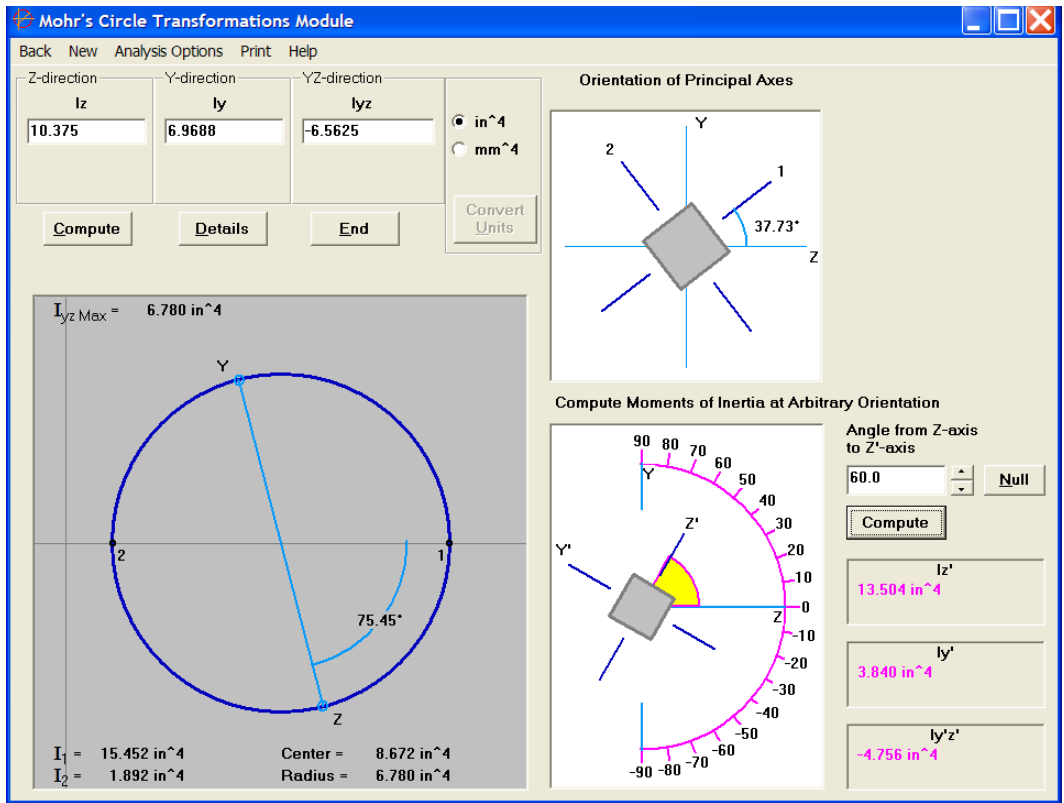
- In regard to lecture notes, the notation of x-axis has changed to z-axis while
- the notation of y-axis has remained y-axis, therefore rotation sense needs to be reversed (or changing the sign of the transposed product of inertia $I_{x'y'} = -I_{z'y'}$).

In the following two figures

- I_1 is called I_{\max} and
- I_2 is called I_{\min} .

Cross-Section Properties			
Z-Z Properties			
Z - Z Properties			
Elastic Modulus	E	1.0000	psi
From bottom to centroid	Y bot	2.0000	inch
From centroid to top	Y top	2.0000	inch
Area of shape	A	4.5000	inch ²
Moment of Inertia	Iz	10.3750	inch ⁴
Section Modulus	Sz	5.1875	inch ³
Section Modulus (bottom)	S bot	5.1875	inch ³
Section Modulus (top)	S top	5.1875	inch ³
Radius of Gyration	rz	1.5184	inch
Plastic Modulus	Zz	6.3750	inch ³
Shape Factor		1.2289	
From bottom to plastic n.a.	Yp bot	2.0000	inch
From plastic n.a. to top	Yp top	2.0000	inch
Polar Moment of Inertia	J	17.3438	inch ⁴
Product of Inertia	Iyz	-6.5625	inch ⁴
Maximum Moment of Inertia	I _{max}	15.4518	inch ⁴
Minumum Moment of Inertia	I _{min}	1.8920	inch ⁴
Angle from z axis to I _{max} axis	B	37.7257	degrees
		Counterclockwise	

Cross-Section Properties			
Y-Y Properties			
Y - Y Properties			
Elastic Modulus	E	1.0000	psi
From left to centroid	Z left	2.7500	inch
From centroid to right	Z right	2.7500	inch
Area of shape	A	4.5000	inch ²
Moment of Inertia	Iy	6.9688	inch ⁴
Section Modulus	Sy	2.5341	inch ³
Section Modulus (left)	S left	2.5341	inch ³
Section Modulus (right)	S right	2.5341	inch ³
Radius of Gyration	ry	1.2444	inch
Plastic Modulus	Zy	4.0000	inch ³
Shape Factor		1.5785	
From left to plastic n.a.	Zp left	2.7500	inch
From plastic n.a. to right	Zp right	2.7500	inch
Polar Moment of Inertia	J	17.3438	inch ⁴
Product of Inertia	Iyz	-6.5625	inch ⁴
Maximum Moment of Inertia	I _{max}	15.4518	inch ⁴
Minumum Moment of Inertia	I _{min}	1.8920	inch ⁴
Angle from y axis to I _{max} axis	B	52.2743	degrees
		Clockwise	



now showing 37.73 to find the values for the principal moments of inertia:

