ANSYS Mechanical APDL. Utility Menu-> WorkPlane

Workplane

makes Working Plane visible



information about an Active Coordinate System

<u>Comments</u>

WP is a single movable coordinate system no. 4. WP may be aligned with any CS. WP may be moved, aligned, and then used to create a new CS. Some commands from Main Menu > Preprocessor > Modelling ... use an actual position of WP to create geometry. 1

Exercise 5.

Clear and start a new database

Utility Menu > File > Clear & Start New > Do not Read File > OK > CLEAR ... EXECUTED? > Yes Utility Menu > Plot > Replot

Display Working Plane

Utility Menu > Work Plane > Display Working Plane

Create a rectangle

Main Menu > Preprocessor > Modeling > Create > Areas > Rectangle > By Dimensions

 $\begin{array}{rrr} X1,\,X2 \ \rightarrow & 0,\,20 \\ Y1,\,Y2 \ \rightarrow & 0,\,10 \ \rightarrow \text{OK} \ \ (\text{Fig. 1}) \end{array}$

Move and rotate WP

Utility Menu > Work Plane > Offset WP by Increments ... X, Y, Z Offsets: $25,5,0 \rightarrow Apply$ (Fig. 2) XY, YZ, ZX Angles: $30,0,0 \rightarrow OK$ (Fig. 3)

Create the next rectangle



 $\begin{array}{ccc} \text{Y1, Y2} \rightarrow & \text{0, 10} \rightarrow \text{OK} \\ \text{(Fig. 4)} \end{array}$



Utility Menu > Work Plane > Local Coordinate Systems > Create Local CS > At WP Origin ... KCN= 11, KCS = Cylindrical 1, PAR1 = $1/2 \rightarrow OK$ (Fig. 5)

KCN Ref number of new coord sys		11	
KCS Type of coordinate system		Cylindrical 1	•
Following used only for elliptical and toro	idal systems		
PAR1 First parameter		1/2	
PAR2 Second parameter	[1	Fig. 5

Fig. 4

<u>Comment</u>

A new created CS was set as an active coordinate system.



Exercise 5.

Turn WP off and plot keypoints with numbers

Utility Menu > Work Plane > Display Working Plane ↓↓ Utility Menu > PlotCtrls > Numbering... > Keypoints Numbers > On → OK Utility Menu > Plot > Keypoints

Plot the triad of a CS no. 11

Utility Menu > PlotCtrls > Symbols > CS Local coordinate system > On \rightarrow OK (Fig. 6)

Create a line in a CS no. 11

Utility Menu > Plot > Lines Main Menu > Preprocessor > Modeling > Create > Lines > In Active Coord > pick keypoints 6 and 8 \rightarrow OK (Fig. 7)

Change active CS to a Global Cartesian

Utility Menu > Work Plane > Change Active CS to > Global Cartesian

Create a line in a Global Cartesian

Main Menu > Preprocessor > Modeling > Create > Lines > In Active Coord > pick keypoints 6 and $8 \rightarrow OK$ (Fig. 8)

Global Cartesian system was set as active, so a new created line is a straight line.



WP can be used as the cutting plane to divide a volume or an area into two pieces: (Main Menu > Preprocessor > Modeling > Operete > Booleans > Divide > Volu by WrkPlane (Main Menu > Preprocessor > Modeling > Operete > Booleans > Divide > Area by WrkPlane)

WP can also be used to define a virtual cross section to check model geometry or present results. Utility Menu > PlotCtrls > Style > Hidden Line Options (Fig. 9)

Fig. 9

V	Hidden-Li	en-Line Options			
TYPE] [/SHADE] Hidden-L	ine Options				
/N Window number		Window 1			
TYPE] Type of Plot	PE] Type of Plot		Capped Z-buffer		
CPLANE] Cutting plane is		Working plane			
(for section and cappe	d displays only)				
REPLOT] Replot upon OK/	Apply?	Replot	•	-	
er l	Apply	Cancel	Help		

Ratio of the rectangle edges is 10/20 = PAR1 (Fig.5), so a new created line is ¼ of an ellipse.







Working Plane

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