# 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

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

#### 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









#### Create a new Coordinate System (elliptical, no. 11)

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)

[CSWPLA] Create Loca	al Coord System at Working	Plane Origin	
KCN Ref number of ne	ew coord sys	11	
KCS Type of coordinat	te system	Cylindrical 1	•
Following used only fo	r elliptical and toroidal syste	ems	
PAR1 First parameter		1/2	
PAR2 Second paramet	ter	1	Fig. 5
OK	Apply	Cancel	Help

#### <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	ine Options		X
TYPE] [/SHADE] Hidden-L	ine Options			
/N Window number		Window 1	•	
TYPE] Type of Plot		Capped Z-buffer		
CPLANE] Cutting plane is		Working plane	$\overline{\mathbf{D}}$	
(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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