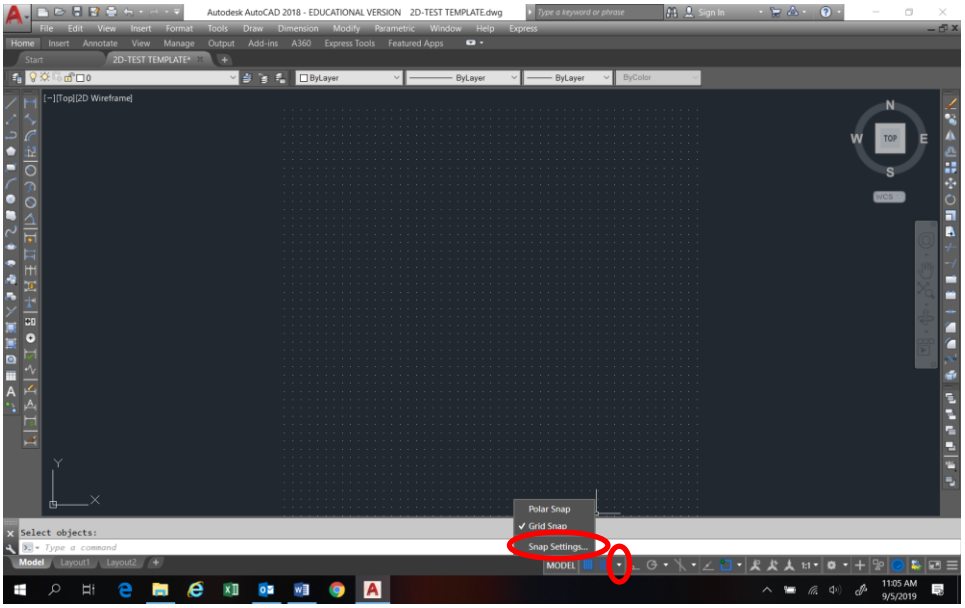
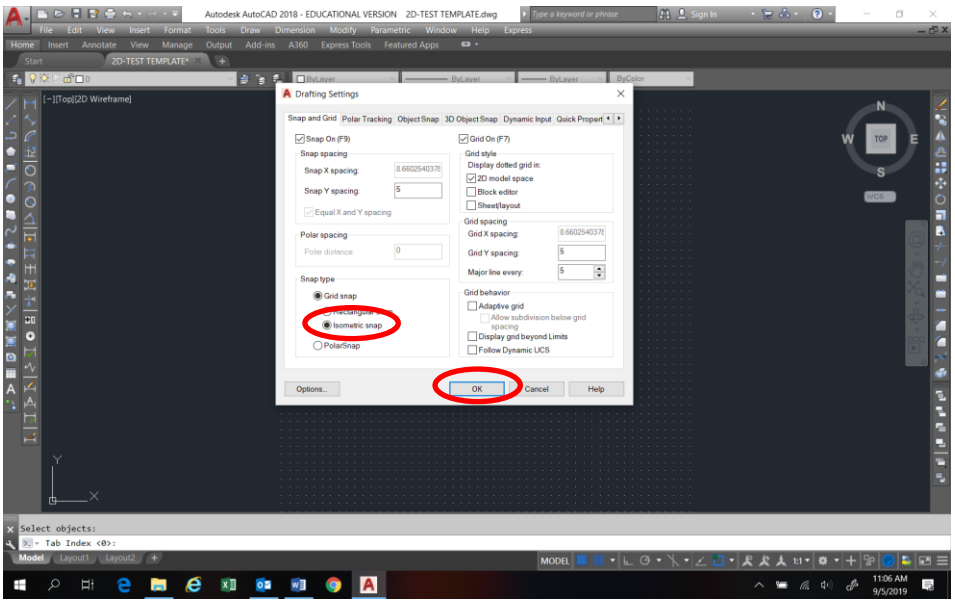
BASIC COMMANDS FOR ISOMETRIC AND ORTHOGRAPHIC DRAWINGS

1. Setting Isometric Snap in Drafting Settings Menu to provide Grid Points aligned to directions 30°, -30°, 150° & -150°:

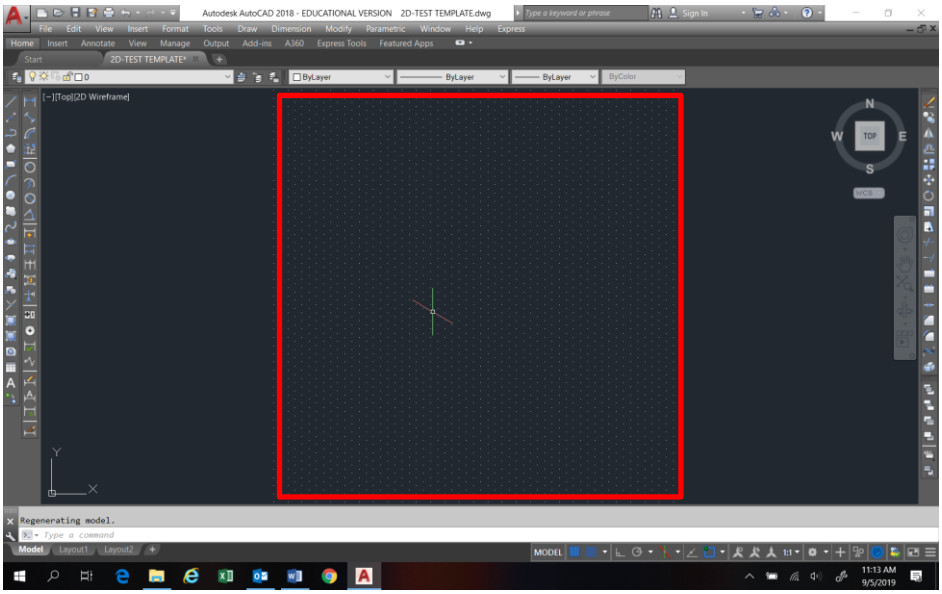
i) Click arrow down and then select Snap Setting



ii) Next, select Isometric Snap and click OK:



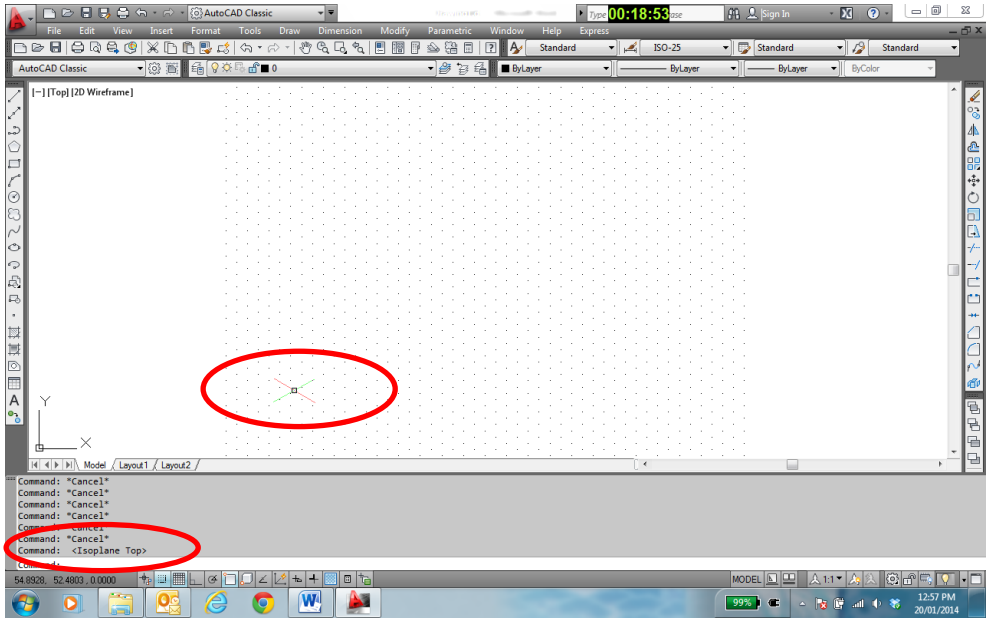
iii) An isometric grid point with alignment to angles 30, -30, 150 & -150 degrees.
IMPORTANT: When drawing Isometric drawings, always set to Isometric Snap.



2. Use F5 key in keyboard to change to Isometric Top, Isometric Left & Isometric Right when drawing top, left and right view objects , e.g. Lines, Iso-circles, Lines, Dimensions, etc.

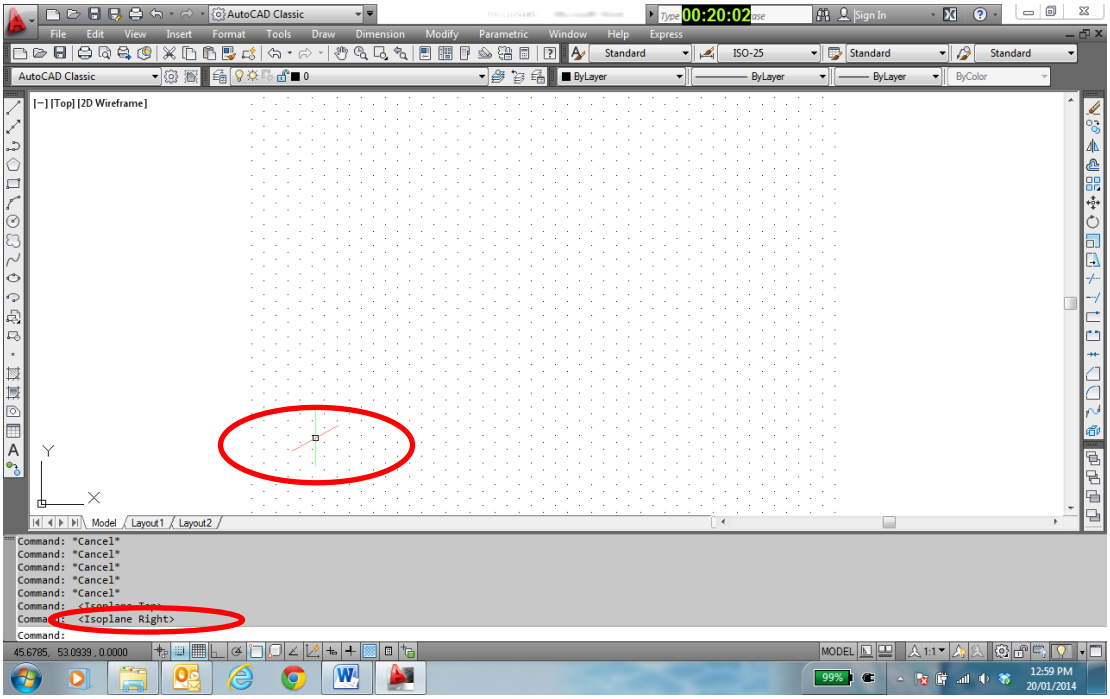
Press F5 key→ Isoplane Top

NOTE: Cursor direction is pointing 30, -30, 150 & -150 degrees.



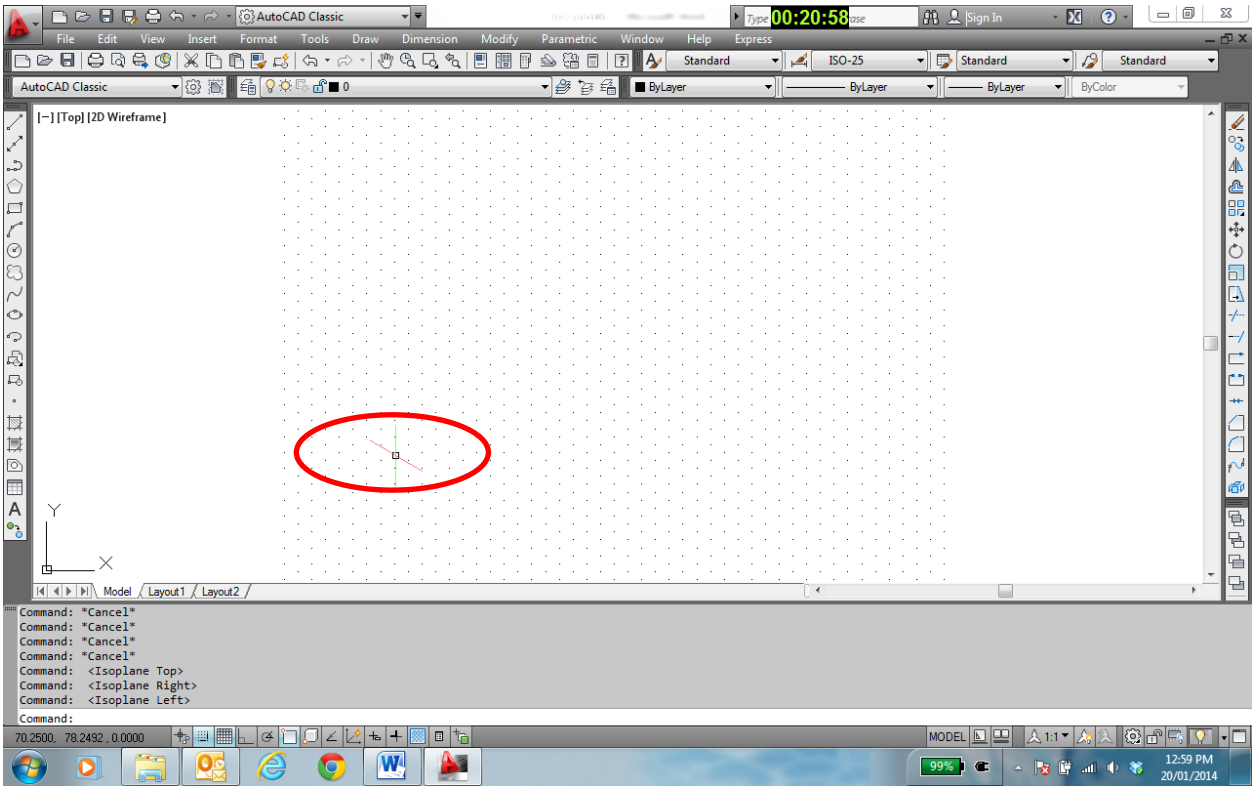
Press F5 key again→ Isoplane Right

NOTE: Cursor direction is pointing 90, -90, 30 & -150 degrees



Press F5 key again→ Isoplane Left

NOTE: Cursor direction is pointing 90,-90, -30 & 150 degrees



3. Draw Iso-Circles:

To draw Iso-circles, <u>Isometric Snap</u> must be set first.

Steps to follow:

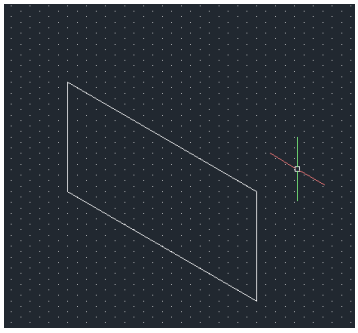
Ellipse→Iso-circles→Centre of circle→Radius of circle→ Enter

i) To draw Iso-circle placed on the centre of rectangle in the Isoplane Left view:

a) Ensure cursor is on Isoplane Left using F5 key.

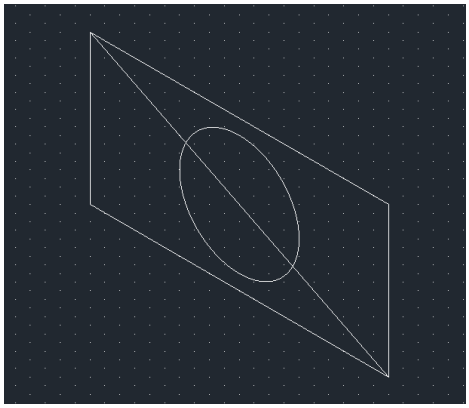
b) Use line command to draw the rectangle (100mm x 50mm) on Isoplane Left.
Note: In Isometric Plane, the rectangle looks like a parallelogram:

```
Command: L
LINE
Specify first point:
Specify next point or [Undo]: @50<90

Specify next point or [Undo]:
>>Enter new value for ORTHOMODE <0>:
Resuming LINE command.

Specify next point or [Undo]: @100<-30

Specify next point or [Close/Undo]: @50<-90

Specify next point or [Close/Undo]: c
```



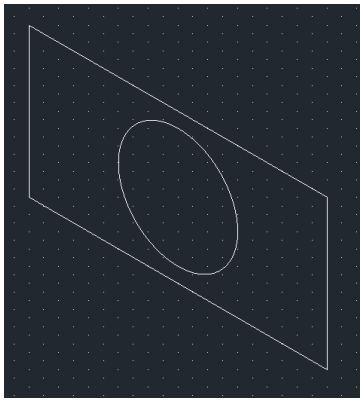
c) Next, draw a diagonal line across the rectangle so that the midpoint of diagonal line can determine the centre of Iso-circle on Isoplane left. Next type command Ellipse→Isocircles→use mouse to click on midpoint of diagonal line to specify centre of circle→specify the radius 20mm
NOTE: Isocircle in Isometric drawing looks like ellipse.

```
L
LINE
Specify first point:
Specify next point or [Undo]:
Specify next point or [Undo]:

Command: EL
ELLIPSE
Specify axis endpoint of ellipse or [Arc/Center/Isocircle]: i

Specify center of isocircle:
Specify radius of isocircle or [Diameter]: 20
```



d) Erase the diagonal line and an iso-circle is drawn at the centre of rectangle on Isoplane Left:

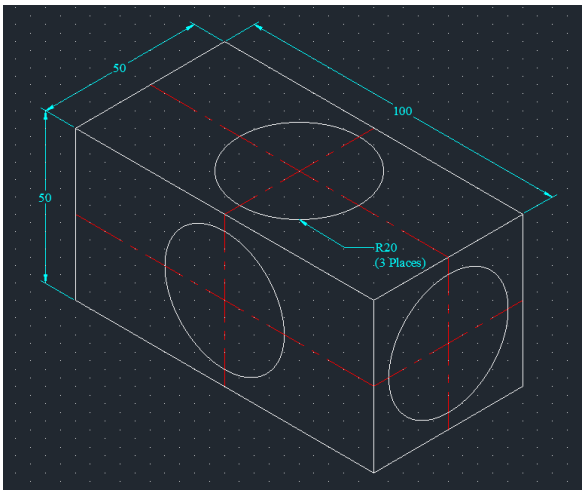
```
Command: E
ERASE
Select objects: 1 found
```



ii) Similarly, to draw Iso-circle on Isoplane Top and Isoplane Right, Use similar technique in Isoplane Left as shown above. Remember to switch the cursor to Isoplane Top & Isoplane Right using F5 Key in Keyboard to draw respective Isocircles in their planes.

iii) Result is as shown below:

NOTE: The iso-circles that looks like ellipse have axes pointing in different directions for different Isoplanes. E.g Isoplane Top, the axes are pointing in 30 & -30 degrees direction, Isoplane left, the axes are pointing in 90 & -30 degrees direction and for Isoplane Right, the axes is pointing in 90 & 30 degrees direction. It should be similar direction to the cursor (Red & green Line) icon.



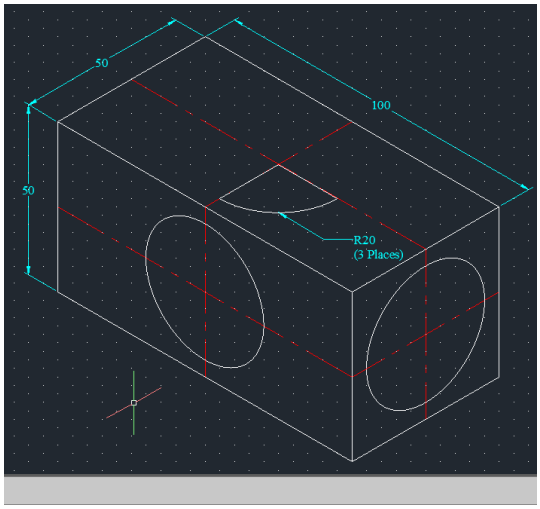
4. Draw Iso-Arc:

Remember: Arc is drawn in anti-clockwise direction.

Steps to follow:

Ellipse→Arc→Iso-circle→Centre of Iso-circle→Radius of Circle→ Start Angle→ End Angle→Enter

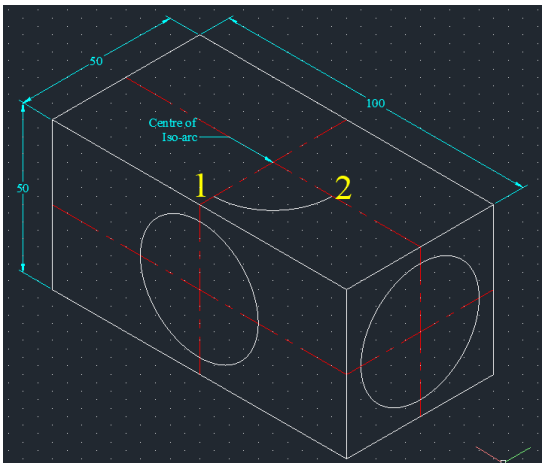
e.g. How to draw an iso-arc R20 on the Isoplane top as shown below:



i) Start with command ellipse→arc→isocircles→specify the centre of circle on the intersection of centre lines→specify radius 20mm→always start with a point (Start Angle point 1) in anti-clockwise direction, then click End Angle (Point 2).

```
Command: EL
ELLIPSE
Specify axis endpoint of ellipse or [Arc/Center/Isocircle]: a

Specify axis endpoint of elliptical arc or [Center/Isocircle]: i

Specify center of isocircle:
Specify radius of isocircle or [Diameter]:  <Isoplane Left>  <Isoplane Top> 20

Specify start angle or [Parameter]:
Specify end angle or [Parameter/Included angle]:
Command:
```

ii) End result as shown in diagram below with an Iso-arc drawn on Isoplane Top:



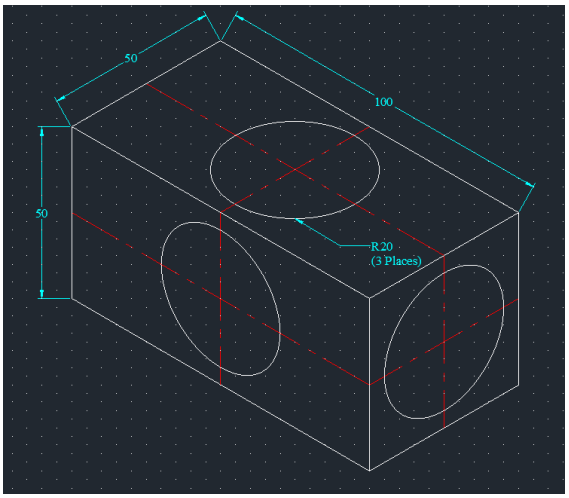
5. Dimension Oblique:

i) First dimension the object using Draw→Dimension→Aligned.

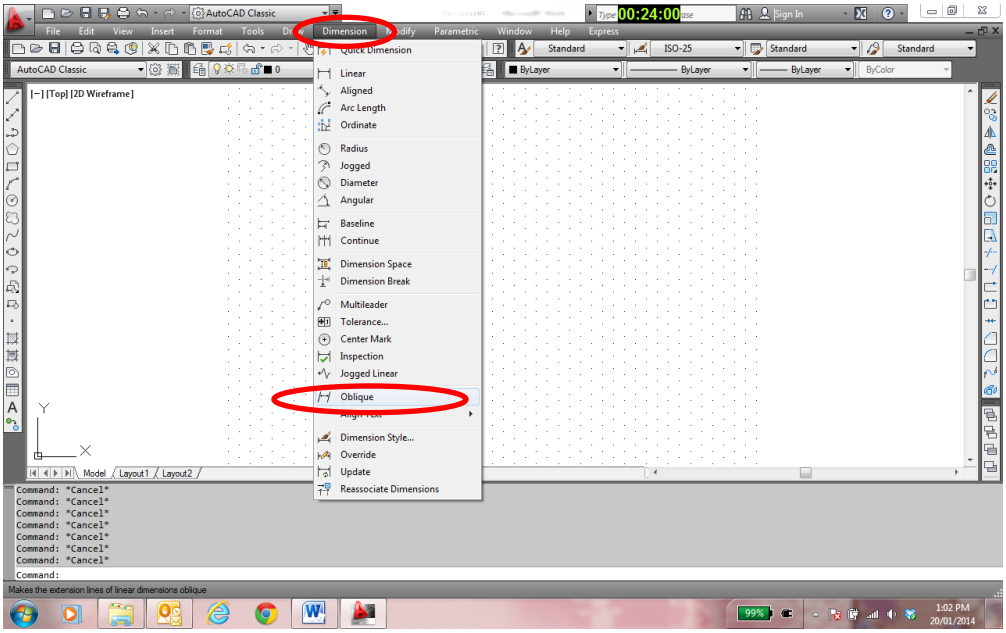
Dimension the 2 numbers of 50mm and 1 number of 100mm edges using Dimension Aligned command.

```
Command: _dimaligned
Specify first extension line origin or <select object>:
Specify second extension line origin:
Specify dimension line location or
[Mtext/Text/Angle]:
Dimension text = 50
Command:
Command:
Command: _dimaligned
Specify first extension line origin or <select object>:
Specify second extension line origin:
Specify dimension line location or
[Mtext/Text/Angle]:
Dimension text = 50
Command:
Command:
Command: _dimaligned
Specify first extension line origin or <select object>:
Specify second extension line origin:
Specify dimension line location or
[Mtext/Text/Angle]:
Dimension text = 100
Command:
Command:
```

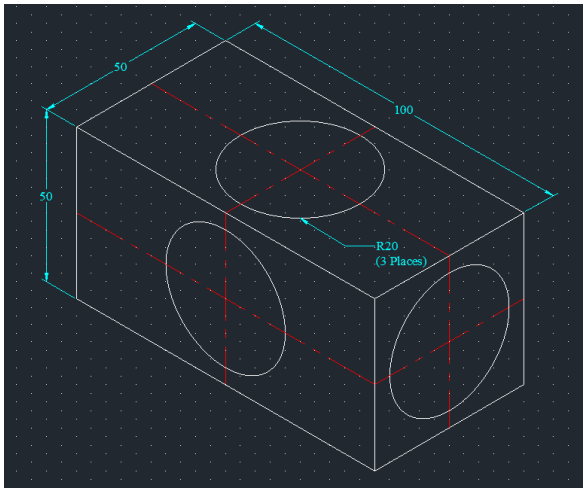
ii) The dimensions are shown in drawing below:



iii) Next dimension the object using Draw→Dimension→Oblique→ Select object to dimension→Select the existing three Aligned dimensions earlier→Enter→Enter Obliquing Angle→Enter



iv) Obliqueing angle for the two 50mm dimensions is 150 degrees (i.e. the angle where the extension lines of dimension are pointing). Similarly, Obliqueing angle for 100mm is 30 degrees (since extension line of dimension is pointing at 30 degrees). Now the diagram looks much neater & presentable in the isometric directions.



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