

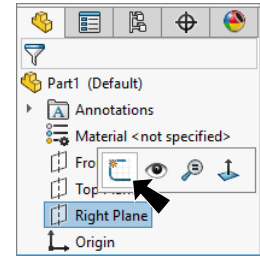




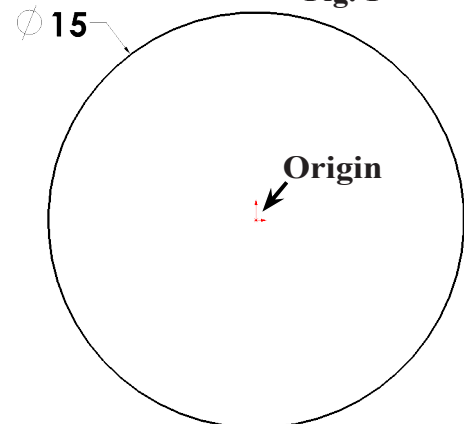
## A. Extrude.

- Step 1. Click File Menu > New, click **Part Metric** and OK.
- Step 2. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 1**.





**Fig. 1**

- Step 3. Click **Circle**  (S) on the Sketch toolbar.
- Step 4. Sketch **circle** starting at the Origin , **Fig. 2**.





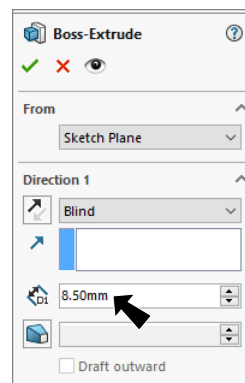
**Fig. 2**

- Step 5. Click **Smart Dimension**  (S) on the Sketch toolbar.
- Step 6. Dimension **diameter 15**, **Fig. 2**.

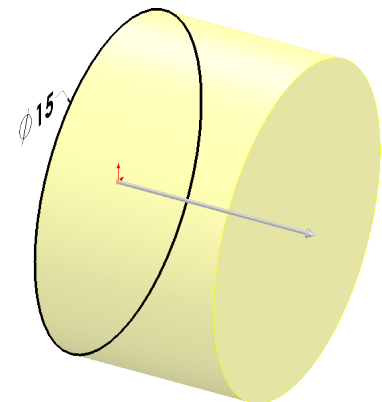
- Step 7. Click **Features**  on the Command Manager toolbar.

- Step 8. Click **Extruded Boss/Base**  on the Features toolbar.

- Step 9. In the Property Manager set:  
 under Direction 1, **Fig. 3**  
**Depth**  **8.5**  
 click OK .



**Fig. 3**





**Fig. 4**

## B. Save as "GEAR 8T".


- Step 1. Click File Menu > Save As.
- Step 2. Key-in **GEAR 8T** for the filename and press ENTER.

## C. Cut Tooth.


Step 1. Click the **side face** and click **Sketch**  on the context toolbar, **Fig. 5**.


Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 3. Click **Convert Entities**  on the Sketch toolbar.



Step 4. In the Convert Entities Property Manager:  
 under Entities to Convert, **Fig. 6**  
 click **edge cylindrical edge**, **Fig. 7**  
 click OK .

Step 5. Click **Circle**  (S) on the Sketch toolbar.

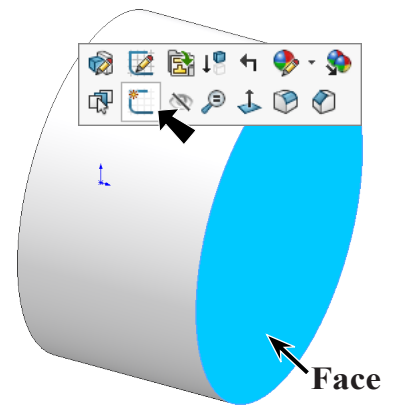
Step 6. Sketch **circle** starting at the Origin , **Fig. 8**.

Step 7. Click **Smart Dimension**  (S) on the Sketch toolbar.

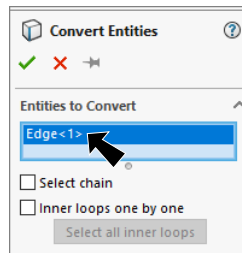
Step 8. Dimension **diameter 8.3**, **Fig. 8**.

Step 9. Click **Centerline**  in the **Line flyout**  on the Sketch toolbar.

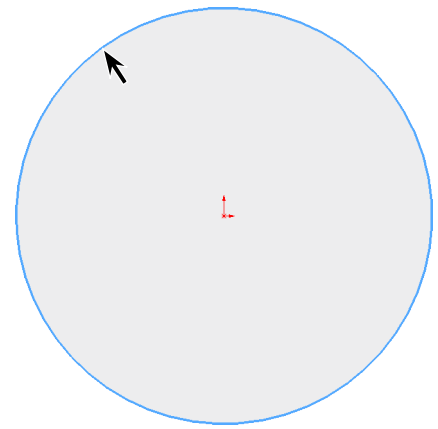
Step 10. Sketch **vertical centerline** up from Origin , **Fig. 9**.



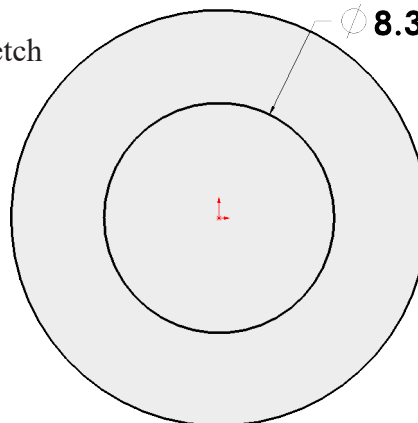
**Fig. 5**



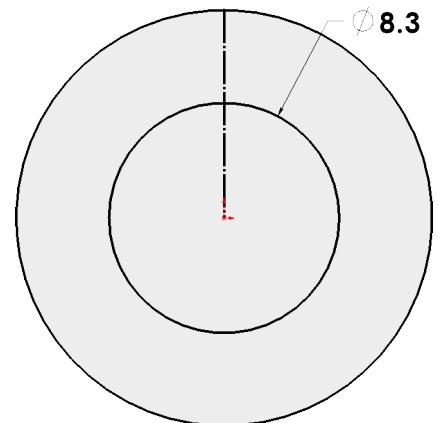
**Fig. 6**



**Fig. 7**



**Fig. 8**



**Fig. 9**

Step 11. Click **Style Spline**  in the **Spline flyout**  on the Sketch toolbar.

Step 12. Sketch a **5 control vertex point Spline** between converted edge and circle, **Fig. 10**. Start at converted edge for 1st control vertex point. Sketch 3 control vertex points and 5th point on circle. Press Escape to end spline.

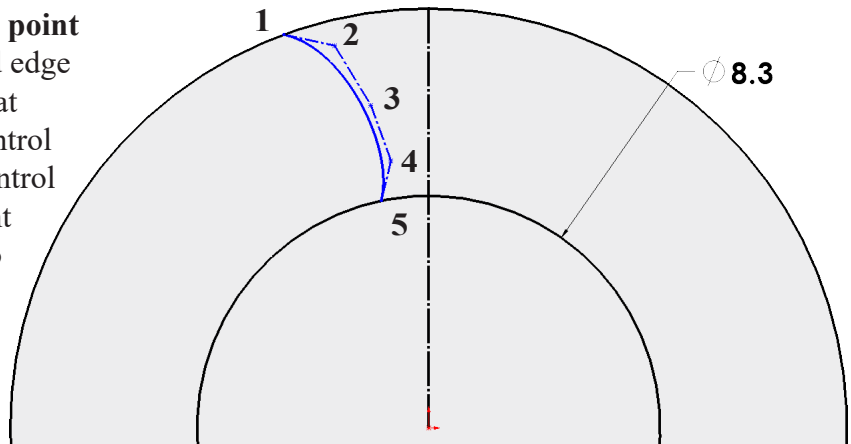



Fig. 10

Step 13. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 14. Dimension spline, **Fig. 11**. To dimension the angle, click Origin, spline point and top endpoint of vertical centerline. Place dimension above sketch. Then, move down below spine.

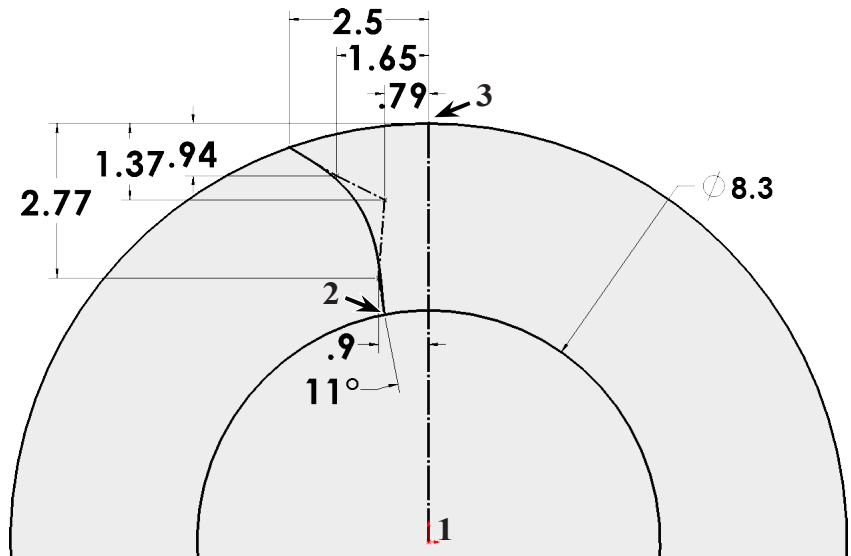





Fig. 11

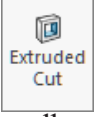
Step 15. **Right click graphics area and click Select**  from menu to unselect Smart Dimension.

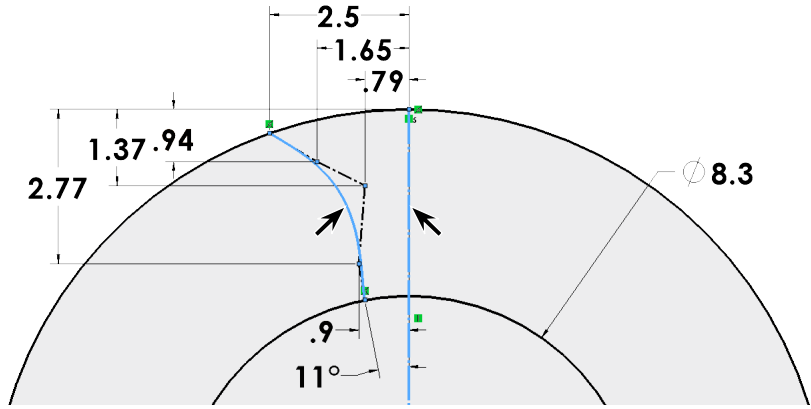
Step 16. **Ctrl click spline and centerline** to select both, **Fig. 12.**

Step 17. Click **Mirror Entities**  on the Sketch toolbar, **Fig. 13.**

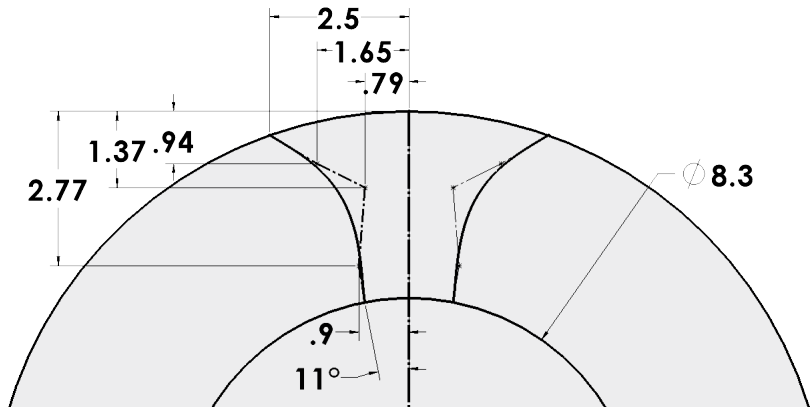
Step 18. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-7**)

Step 19. Click **Features**  on the Command Manager toolbar.


Step 20. Click **Extruded Cut**  on the Features toolbar.



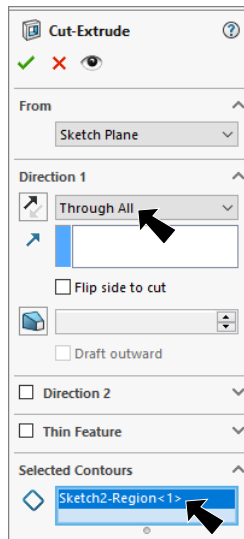
**Fig. 12**



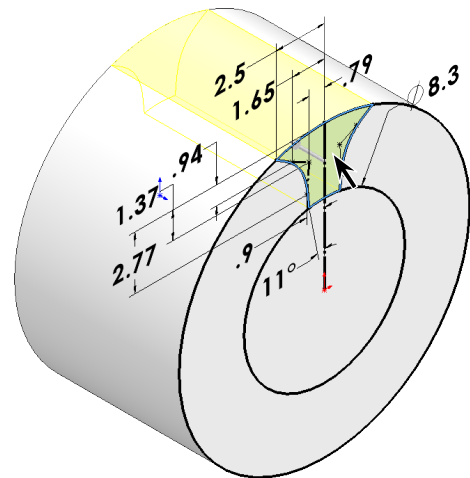
**Fig. 13**

Step 21. In the Cut-Extrude Property Manager set:  
 under Direction 1, **Fig. 14**  
 End Condition **Through All**  
 under Selected Contours  
 click **contour**, **Fig. 15**  
 click **OK** .

Step 22. Save  (**Ctrl-S**).



**Fig. 14**





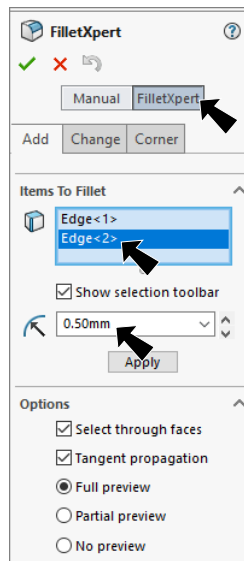
**Fig. 15**

## D. Fillet Edges.

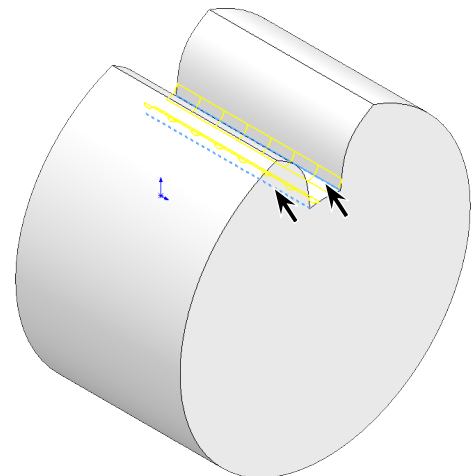
Step 1. Click **Fillet**  on the Features toolbar.

Step 2. In the Fillet Property Manager set:  
select **FilletXpert**, **Fig. 16**

**Radius**  **.5**  
click **both edge at bottom of cut**, **Fig. 17**  
click **OK** .



**Fig. 16**






**Fig. 17**

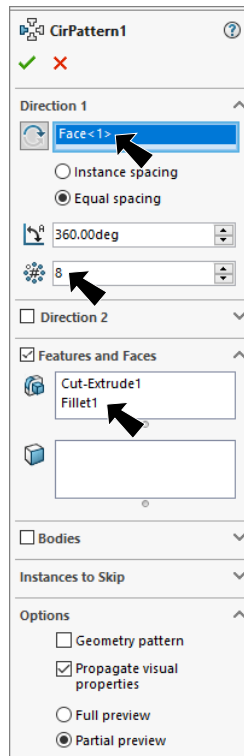
## E. Circular Pattern.

Step 1. Click **Circular Pattern**

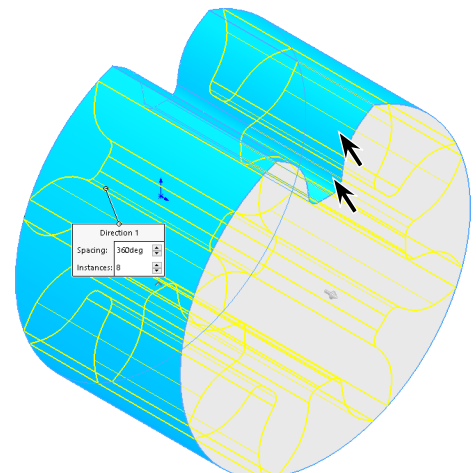
 **Circular Pattern** in the **Linear Pattern flyout**  on the Features toolbar.

Step 2. In the Circular Pattern Property Manager set:  
under Features and Faces, **Fig. 18**  
click **Cut-Extrude1** and **Fillet1**, **Fig. 19**

under **Direction 1**  
click in **Pattern Axis** box  
click the **cylindrical face**  
**Total Angle**  **360**  
check **Equal spacing**  
**Number of Instances**  **8**  
click **OK** .



**Fig. 18**



**Fig. 19**

Step 3. Save  (**Ctrl-S**).

## F. Move Copy Body.

Step 1. Click Insert Menu > Features > Move/Copy.

Step 2. In the Move/Copy Property Manager set:

under Body-Move/Copy, **Fig. 20**

click **body**, **Fig. 21**

under **Rotate**

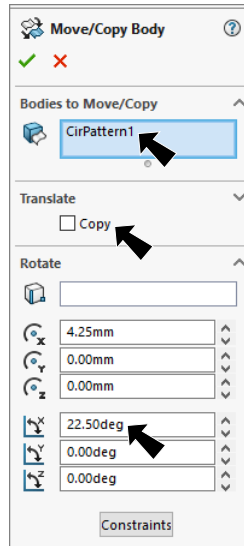
uncheck **Copy**

X  22.5

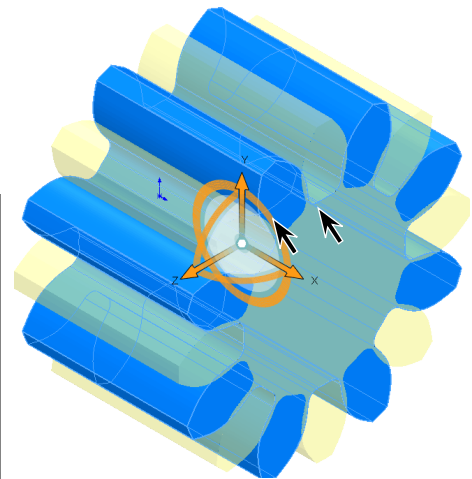
click OK  .

Step 3. Save  (Ctrl-S).

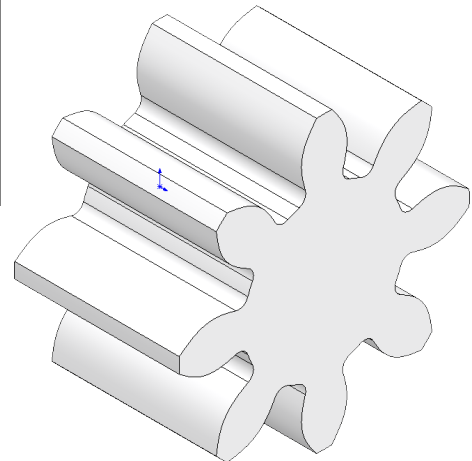
**Note:** This gear part file will be inserted into other gear parts (Gear Idler 32-8T and Gear Pinion 12-8T). Therefore, this part will not be inserted into an assembly, thus shaft hole and appearance is not necessary.



**Fig. 20**



**Fig. 21**



**Fig. 22**