



## 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**.

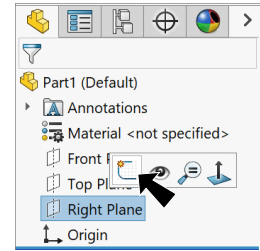


Fig. 1

Step 3. Click **Circle**  (S) on the Sketch toolbar.

Step 4. Sketch **two circles at Origin** , **Fig. 2**.

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

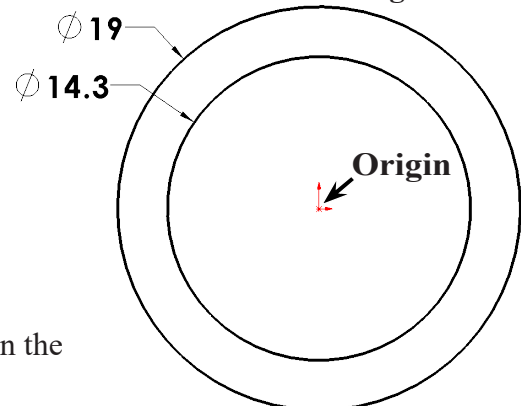



Fig. 2

Step 6. Dimension **diameters 19 and 14.3**, **Fig. 2**.

Step 7. Click **Centerline**  in the **Line flyout**  on the Sketch toolbar.

Step 8. Sketch a **vertical centerline from the Origin**  **up to inside circle**, **Fig. 3**.

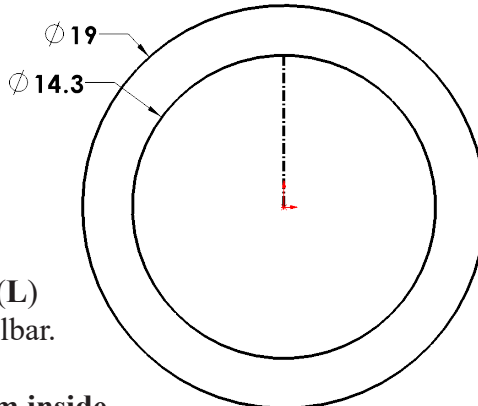


Fig. 3

Step 9. Click **Line**  (L) on the Sketch toolbar.

Step 10. Sketch a **line from inside circle at angle down part way to centerline and line back up to circle**, **Fig. 4**.

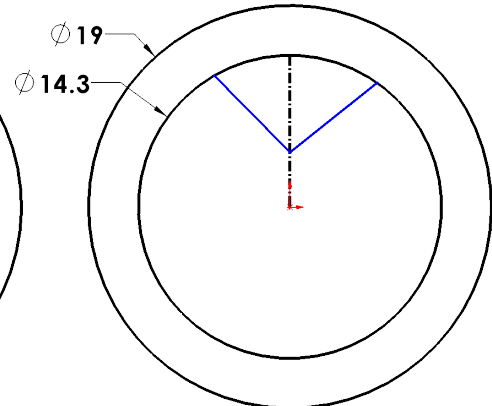



Fig. 4

Step 11. **Unselect Line tool**. To unselect, **right click graphics area and click Select**  from menu.

Step 12. **Drag a selection to left to cross angled lines and centerline**. Click **Make Symmetric**  on the context toolbar, **Fig. 5**.

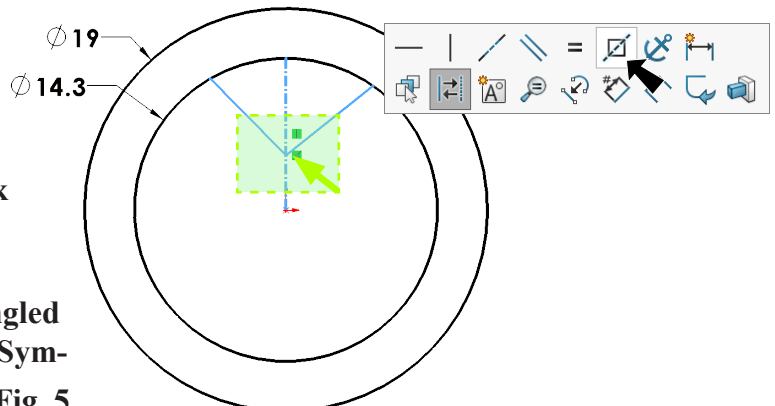
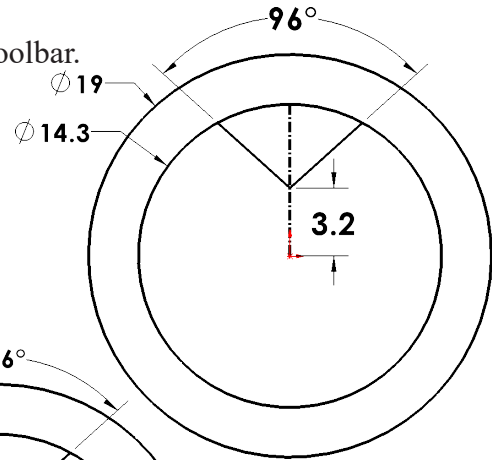


Fig. 5

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



Step 14. Add dimensions, **Fig. 6**.



**Fig. 6**

Step 15. Click **Sketch Fillet** on the Sketch toolbar.

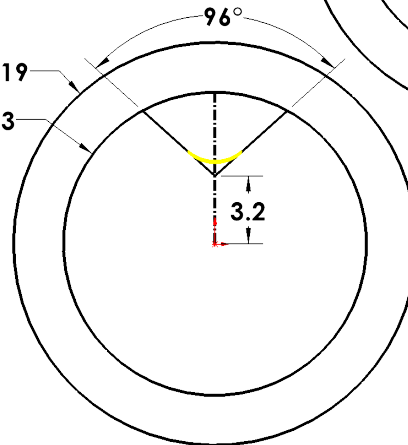


Step 16. In the Sketch Fillet Property Manager set:  
under Fillet Parameters, **Fig. 7**

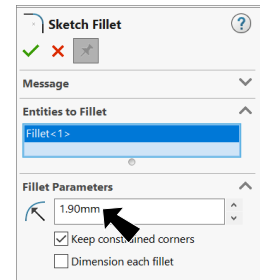
**Radius** 1.9

click **intersection of angled lines**, **Fig. 8**

click **OK** twice.



**Fig. 8**

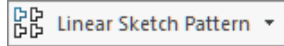


**Fig. 7**

Step 17. Click **Circular Sketch Pattern** in the **Linear Sketch Pattern** flyout on the Sketch toolbar.



**Linear Sketch Pattern**



Step 18. In the Circular Sketch Pattern Property Manager set:  
under Parameters, **Fig. 9**

click in the **Pattern Axis** box

click the **Origin** in sketch, **Fig. 10**

check **Equal spacing**

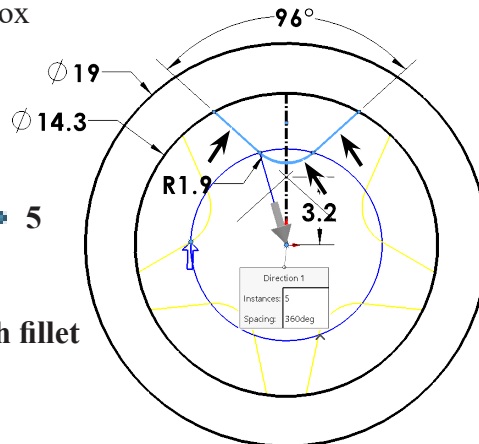
**Number of Instances** 5

under Entities to Pattern

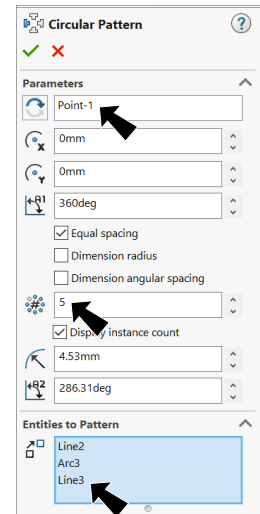
click in the box

click **both lines and sketch fillet**

click **OK**.

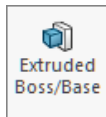




**Fig. 10**

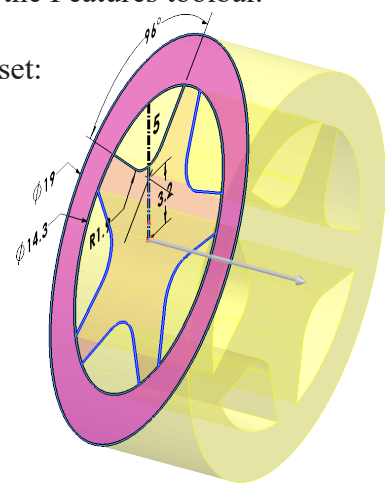


**Fig. 9**

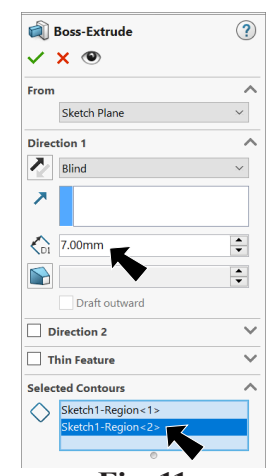
Step 20. Click **Features**  on the Command Manager toolbar.

Step 21. Click **Extruded Boss/Base**  on the Features toolbar.

Step 22. In the Boss-Extrude Property Manager set:  
 under Direction 1, **Fig. 11**  
 End Condition **Blind**  
**Depth**  **7**  
 under Selected Contours  
 click **both contours**, **Fig. 12**  
 click OK .



**Fig. 12**



**Fig. 11**


**B. Save as "RIM".**

Step 1. Click File Menu > Save As.

Step 2. Key-in **RIM** for the filename and press ENTER.

**C. Axle Hole.**

Step 1. Click **Right**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 13**.

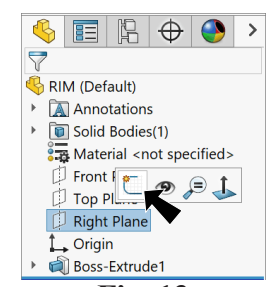
Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 3. Click **Circle**  (S) on the Sketch toolbar.

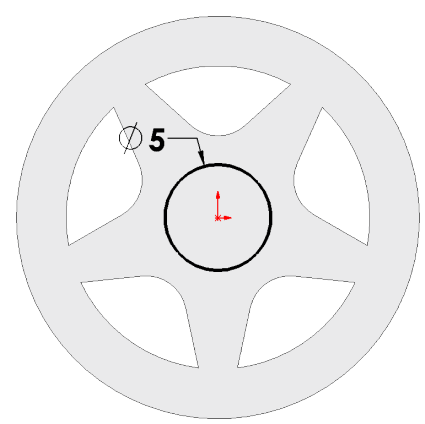
Step 4. Sketch circle at Origin , **Fig. 14**.

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

Step 6. Dimension **diameter 5**, **Fig. 14**.





**Fig. 13**

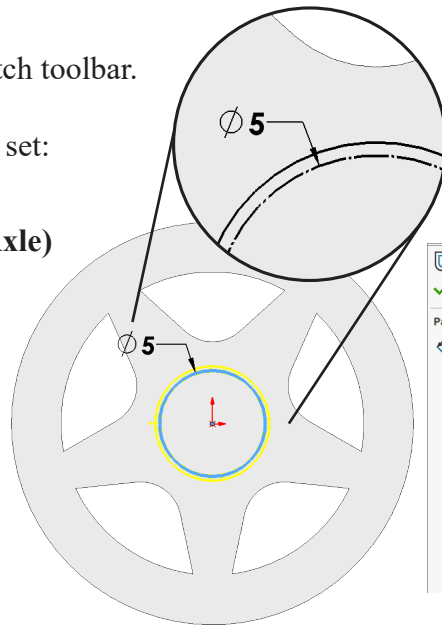


**Fig. 14**

Step 7. Click **Offset Entities**  on the Sketch toolbar.


Step 8. In the Offset Entities Property Manager set:  
under Parameters, **Fig. 15**

**Distance**  **.2 (clearance of Axle)**  
under Construction geometry  
check **Base geometry**  
click **circle**, **Fig. 16**  
**Yellow offset circle on outside -  
base geometry (construction)  
on inside**  
click OK .



**Fig. 16**



**Fig. 15**

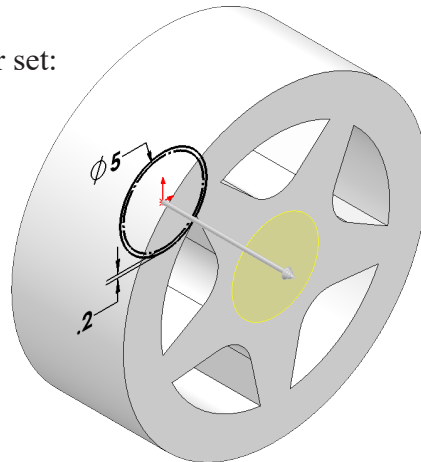
Step 9. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-7**)

Step 10. Click **Features**  on the Command Manager toolbar.

Step 11. Click **Extruded Cut**  on the Features toolbar.

Step 12. In the Cut-Extrude Property Manager set:  
under Direction 1, **Fig. 17**

End Condition **Through All**  
**Reverse Direction**   
click OK .



**Fig. 18**


**Fig. 17**

Step 13. Save  (**Ctrl-S**).

## D. Appearance: Chrome.

Step 1. Click the part to select part, click **Appearances Callout**



on the context toolbar and click **RIM** , Fig. 19.

Step 2. In the Appearances Task pane, expand **Metal** and click **Chrome** and in the lower pane select **chromium plate**, Fig. 20.

Step 3. In the Appearances Property Manager click OK .

Step 4. Save  (Ctrl-S).

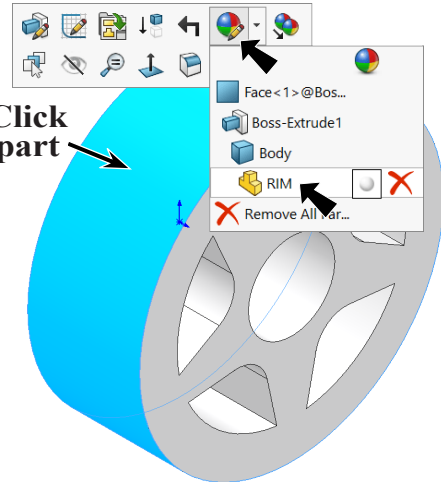


Fig. 19

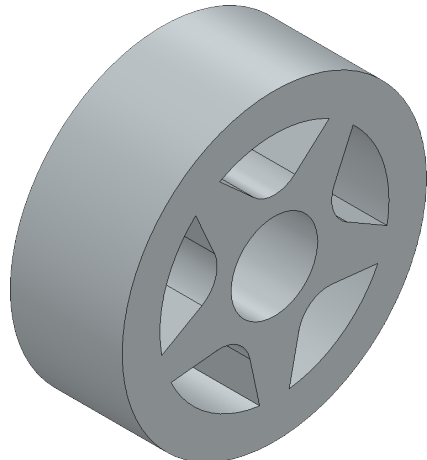


Fig. 32

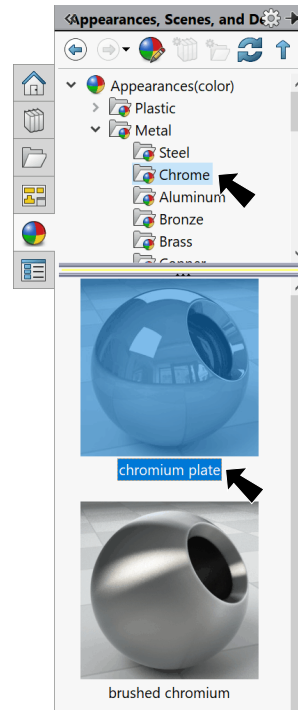


Fig. 20

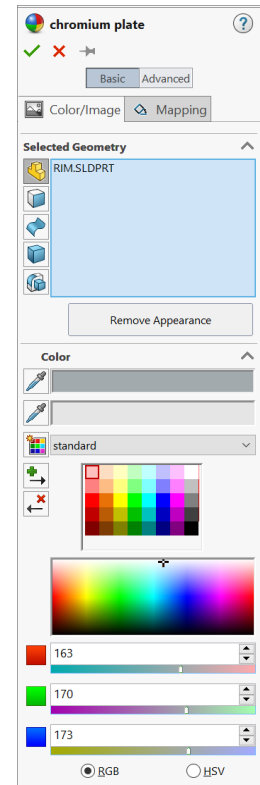


Fig. 21