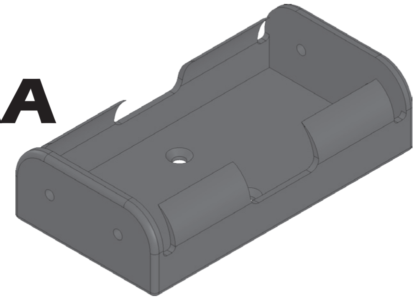

Cluster Wheel Vehicle

Battery Holder 2x AA

A. Extrude.

Step 1. Click File Menu > New, click **Part Metric** and OK.

Step 2. Click **Front Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 1**.

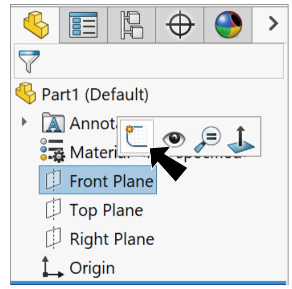

Fig. 1

Step 3. Click **Corner Rectangle** in the **Rectangle flyout** on the Sketch toolbar.

Step 4. Sketch a rectangle **above** Origin, **Fig. 2**.

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

Step 6. Add dimensions, **Fig. 2**.

Step 7. **Unselect Rectangle tool**. To unselect, right click graphics area and click Select from menu.

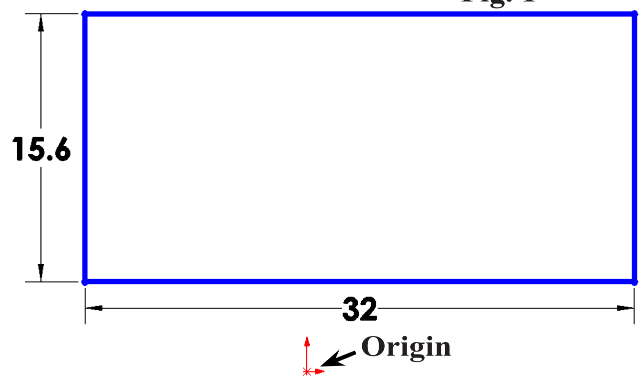

Fig. 2

Step 8. **Ctrl click bottom line of rectangle** and the **Origin**. Release Ctrl key and click **Make Midpoint** on the context toolbar, **Fig. 3**.

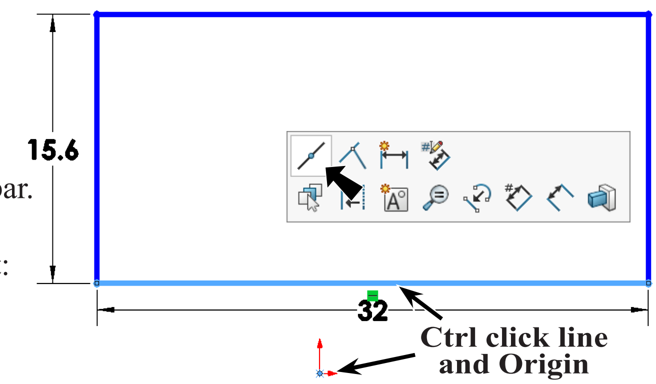

Fig. 3

Step 9. Click **Sketch Fillet** on Sketch toolbar.

Step 10. In the Sketch Fillet Property Manager set: under Fillet Parameters, **Fig. 4**

Radius 7

click **both top corners**, **Fig. 5**

click OK **twice**.

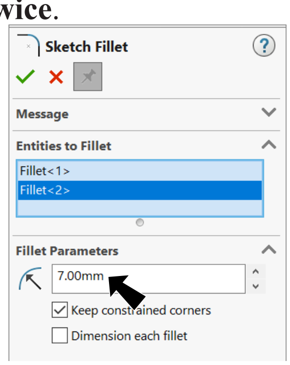

Fig. 4

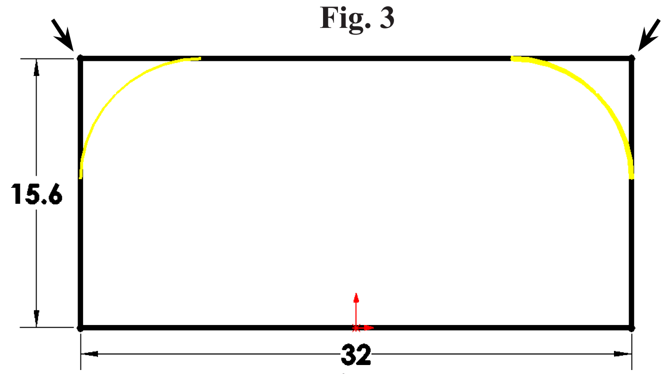

Fig. 5

12/30/24

Step 11. Click **Features** Features on the Command Manager toolbar.

Step 12. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 13. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 6**
End Condition **Mid Plane**
Depth 58.8
click OK .

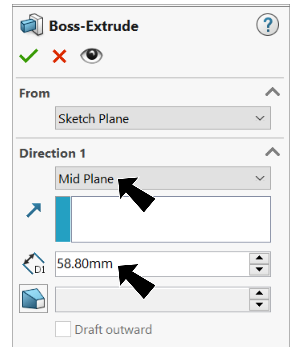

Fig. 6

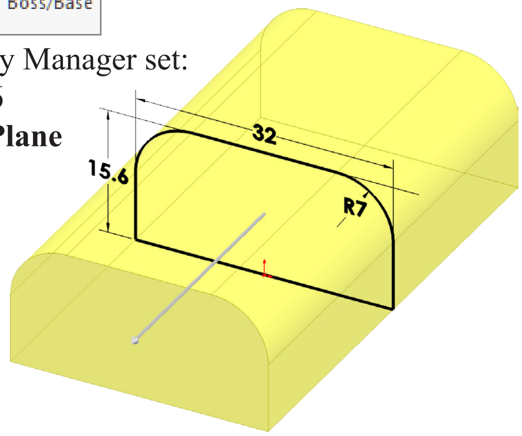

Fig. 7

B. Save as "BATTERY HOLDER 2X AA".

Step 1. Click File Menu > Save As.

Step 2. Key-in **BATTERY HOLDER 2X AA** for the filename and press ENTER.

C. Side Cut.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 8**.

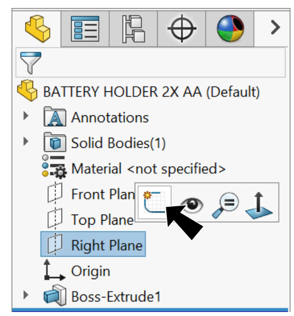

Fig. 8

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

Step 3. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4. Sketch centerline up from the Origin , **Fig. 9**.

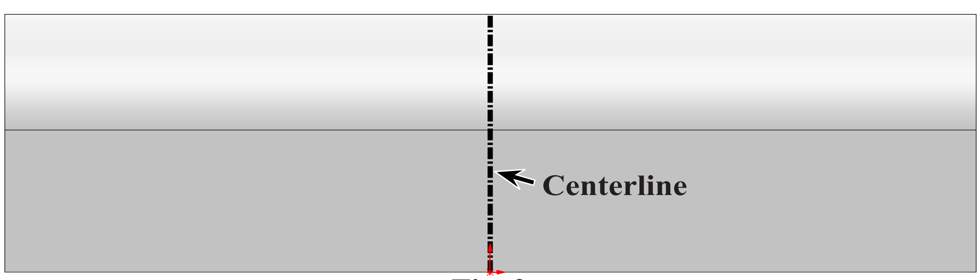

Fig. 9

Step 5. Click **Line** (**L**) on the Sketch toolbar.

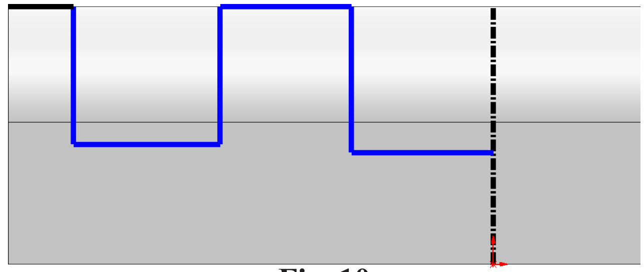

Fig. 10

Step 6. Sketch **7** lines as shown in, **Fig. 10**. Keep the top lines on edge.

Step 7. Right click graphics area and click Select from menu to unselect Line tool.

Step 8. **Ctrl click bottom horizontal lines** to select both. Release Ctrl key and click **Make Collinear** on the context toolbar, **Fig. 11**.

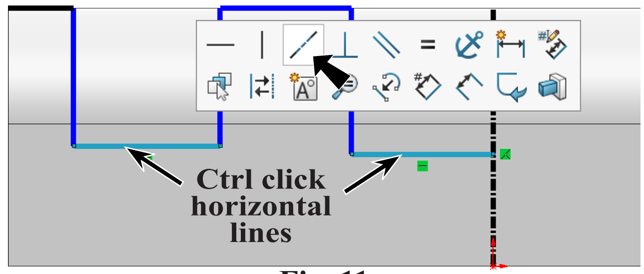

Fig. 11

Step 9. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 10. Add dimensions, **Fig. 12**.

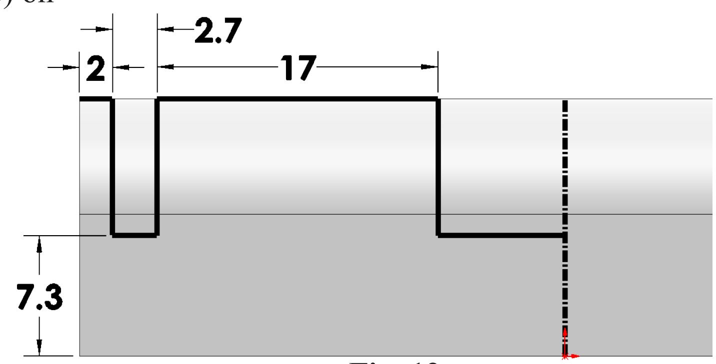

Fig. 12

Step 11. Click **Sketch Fillet** on the Sketch toolbar.

Step 12. In the Sketch Fillet Property Manager set:
under Fillet Parameters, **Fig. 13**

Radius 1.8
click the **3 corners**,
Fig. 14
click OK .

Radius .8
Fig. 15
click the **2 corners**,
Fig. 16
click OK **twice**.

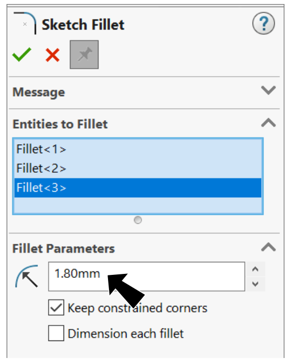

Fig. 13

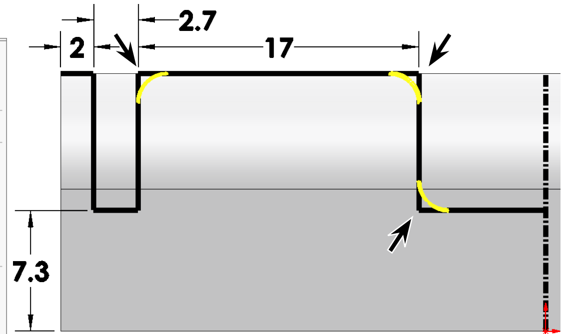

Fig. 14

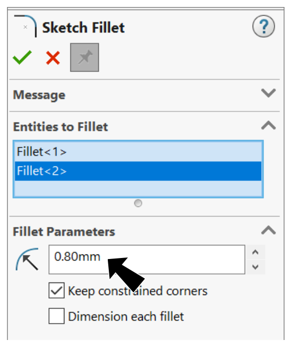

Fig. 15

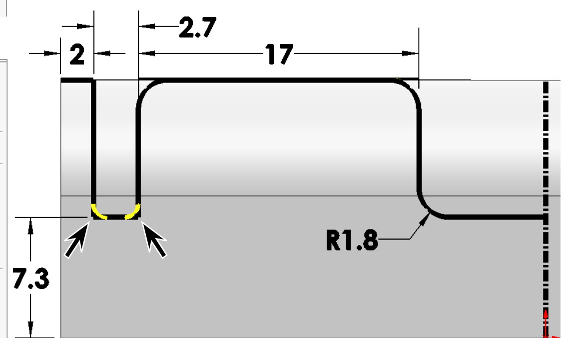

Fig. 16

Step 13. **Drag selection** to select all entities, **Fig. 17**.

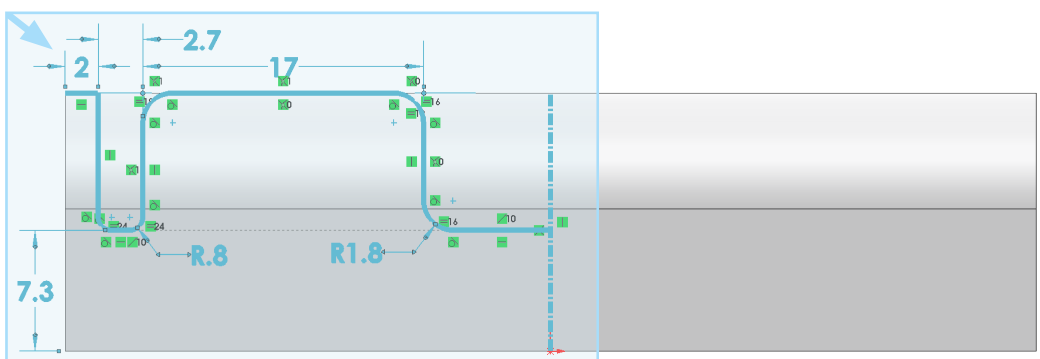

Fig. 17

Step 14. Click **Mirror Entities** Mirror Entities on the Sketch toolbar, **Fig. 18**.

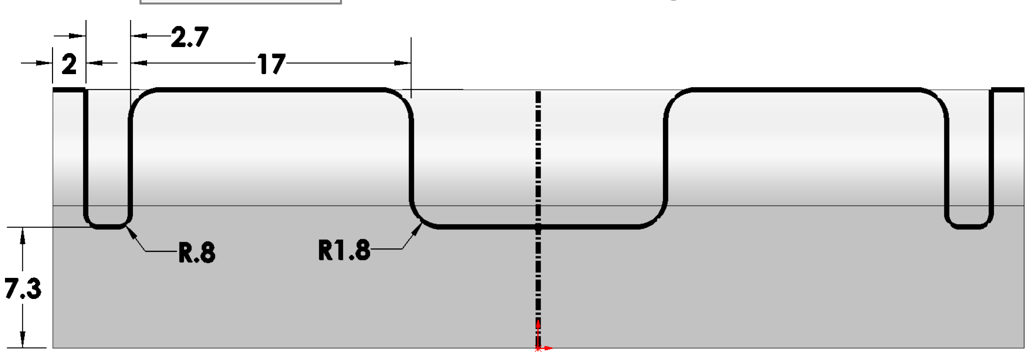

Fig. 18

Step 15. Click **Trimetric** on the Standard Views toolbar.

Step 16. Click **Features** on the Command Manager toolbar.

Step 17. Click **Extruded Cut** on the Features toolbar.

Step 18. In the Cut-Extrude Property Manager set:

under Direction 1, **Fig. 19**

End Condition

Through All - Both

check **Flip side to cut**.

The Direction arrow should point towards area to be cut away (**up**), **Fig. 20**.

If arrow is pointing in wrong direction, uncheck **Flip side to cut**, **Fig. 19**.

Click OK .

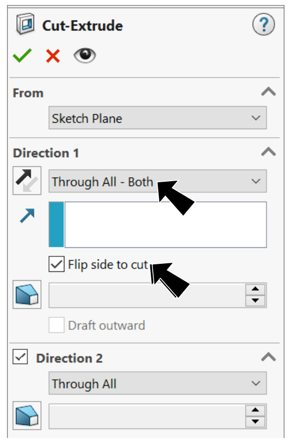

Fig. 19

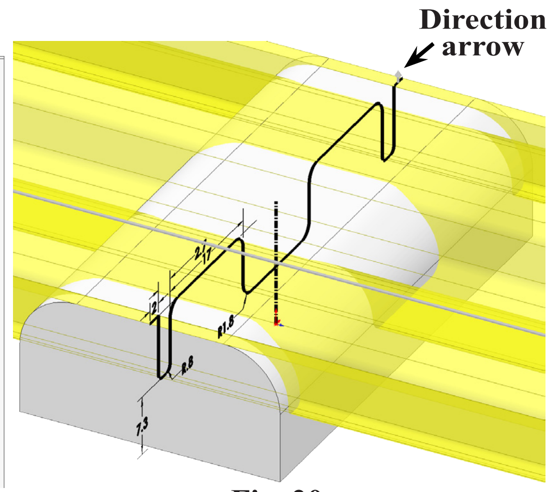

Fig. 20

Step 19. Save **(Ctrl-S)**.

D. Inside Cut.

Step 1. Click **inside rear face of Holder** and click **Sketch** on the context toolbar, **Fig. 21**.

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

Step 3. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4. Sketch vertical centerline up from Origin , **Fig. 22**.

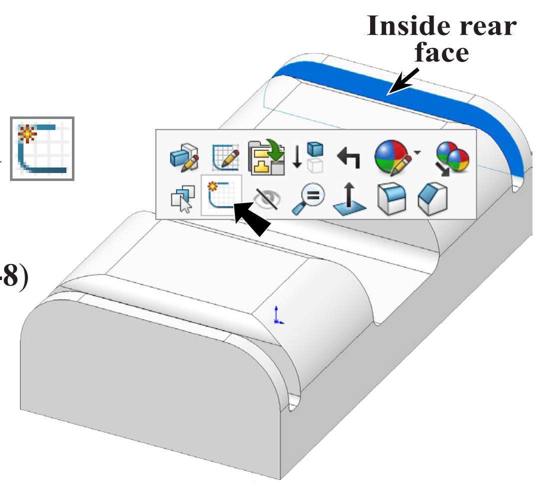

Fig. 21

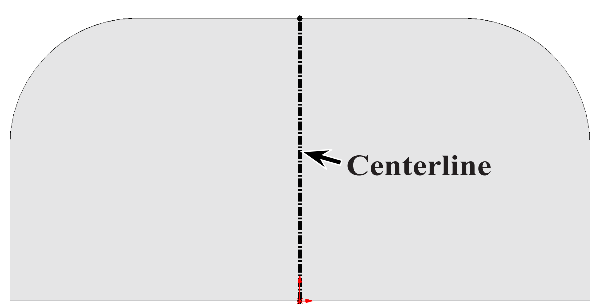

Fig. 22

Step 5. Click **Line** (**L**) on the Sketch toolbar.

Step 6. Start at the centerline, sketch **2 lines, arc and line**, **Fig. 23**. Autotransition to Tangent Arc tool to sketch arc To autotransition to arc, after sketching endpoint of line, move cursor away and back.

Step 7. Start at bottom left corner, sketch **line along edge and tangent arc to first arc**, **Fig. 24**.

Step 8. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 9. Add dimensions, **Fig. 25**.

Step 10. **Unselect Smart Dimension**. To unselect, right click graphics area and click Select from menu.

Step 11. **Ctrl click top endpoint of vertical lines** to select both. Release Ctrl key and click **Make Horizontal** on the context toolbar, **Fig. 26**.

Step 12. **Drag selection around sketch** to select all entities, **Fig. 27**.

Step 13. Click **Mirror Entities** on the Sketch toolbar, **Fig. 28**.

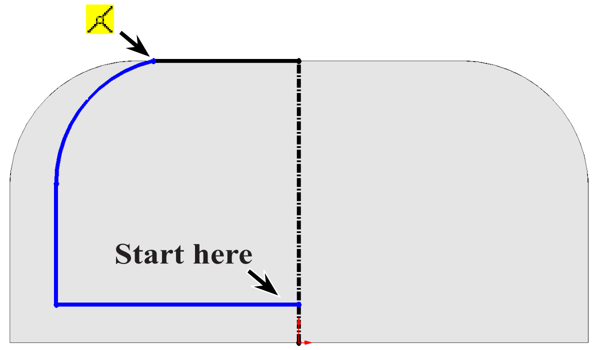

Fig. 23

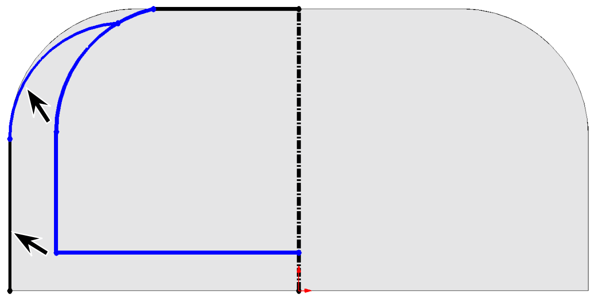
Fig. 24

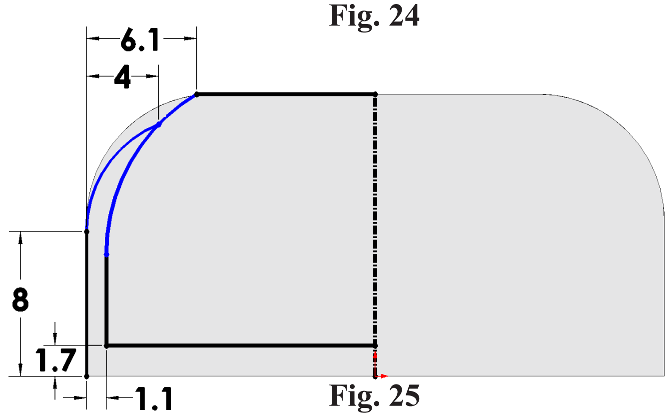

Fig. 25

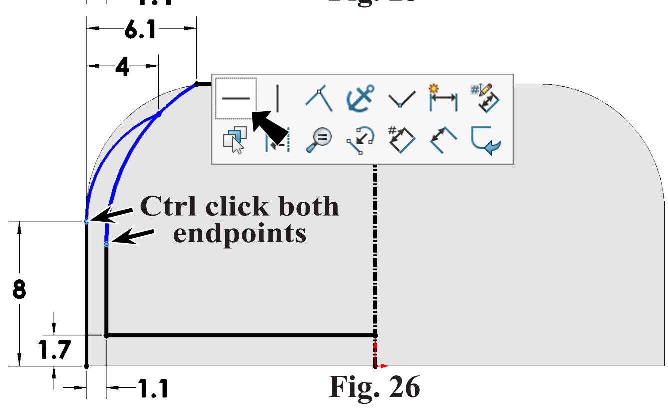

Fig. 26

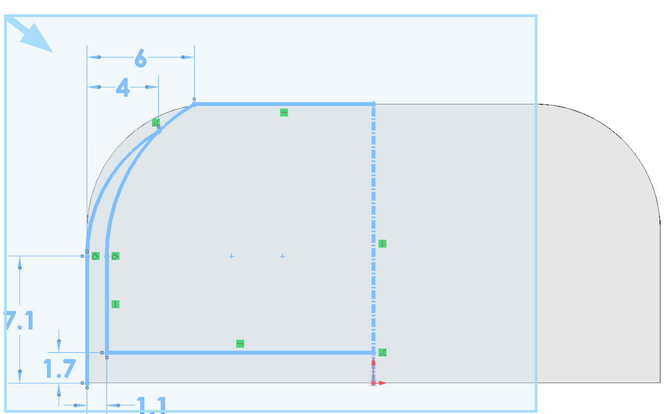

Fig. 27

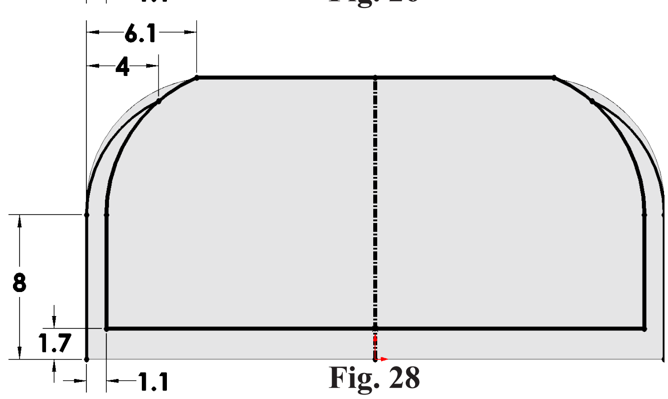

Fig. 28

Step 14. Click **Features** Features on the Command Manager toolbar.

Step 15. Click **Extruded Cut** Extruded Cut on the Features toolbar.

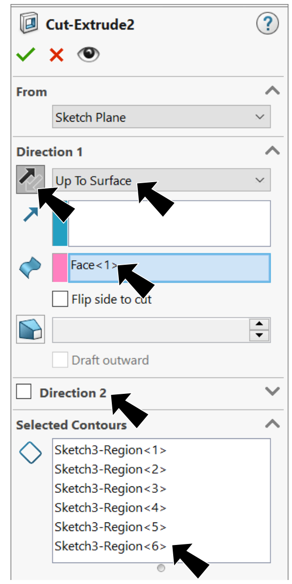

Fig. 29

Step 16. In the Cut-Extrude Property Manager set:

under Selected Contours, **Fig. 29**

click the **6 contours**, **Fig. 30**

under Direction 1

End Condition **Up To Surface**

Reverse Direction

in the **Face/Surface** box

Rotate view to view **inside front face at the other end of Holder**, To rotate view, click **Trimetric** on the Standard Views toolbar, then **Shift click the Y axis of the Reference Triad**, **Fig. 31**.

click **inside front face of Holder**

uncheck Direction 2

click OK .

Step 17. Save **(Ctrl-S)**.

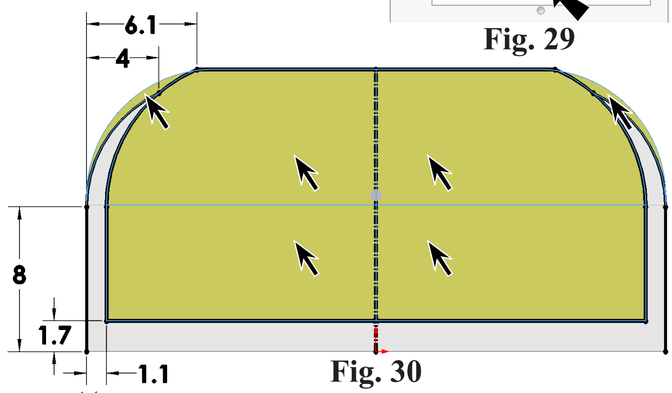

Fig. 30

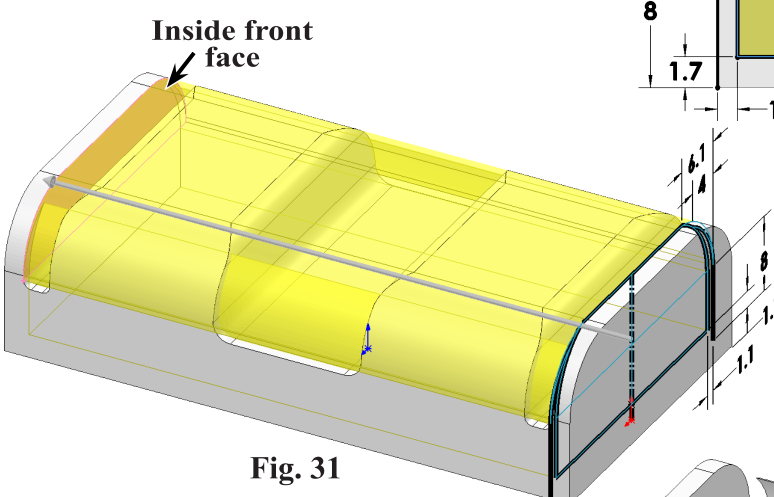

Fig. 31

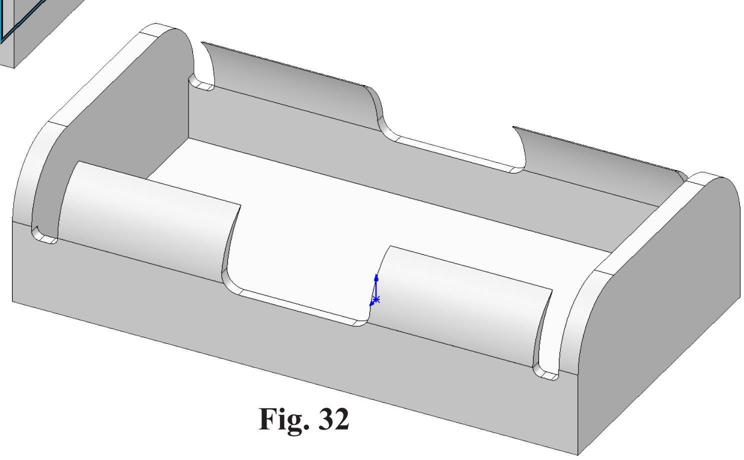

Fig. 32

E. Hole Wizard Countersinks.

Step 1. Click **Top** on the Standard Views toolbar. (**Ctrl-5**)

Step 2. Click **Hole Wizard** on the Features toolbar.

Step 3. In the Property Manager on the Type tab set:
under Hole Type, **Fig. 33**
click **Countersink**
under Standard:
select **ANSI Metric**
under Type:
select **Flat Head Screw ANSI B18....**
under Hole Specification:
Size: M2
under End Condition
End Condition **Through All**

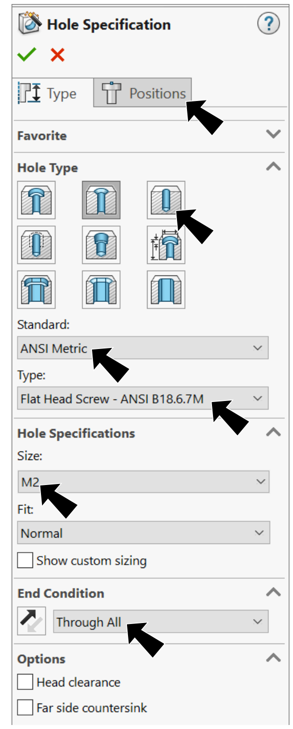

Fig. 33

click **Positions tab** Positions at top of the Property Manager.

Step 4. Click **inside bottom face of Holder** one time as face for holes and click **face to place a point**, **Fig. 34**.

Step 5. **Unselect Point tool**. To unselect, right click graphics area and click Select from menu.

Step 6. **Ctrl click point and Origin** to select both. Release Ctrl key and click **Make Horizontal** on the context toolbar, **Fig. 35**.

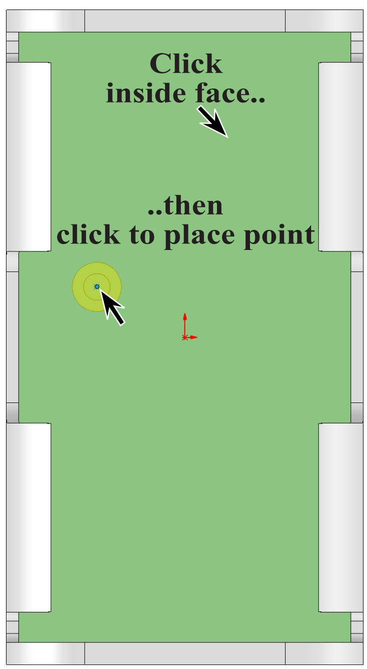

Fig. 34

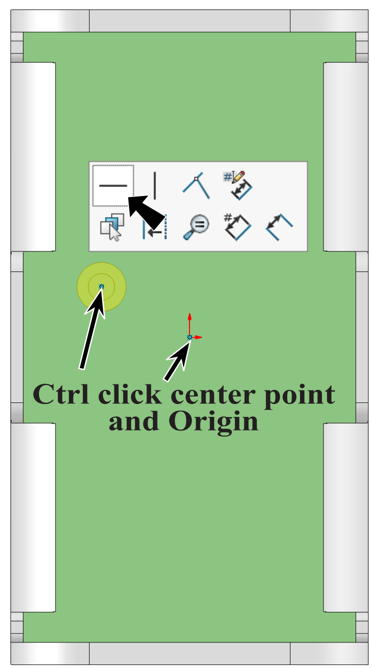

Fig. 35

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

Step 8. Sketch **vertical centerline from Origin**, **Fig. 36**.

Step 9. **Unselect Centerline tool**. To unselect, right click graphics area and click Select from menu.

Step 10. Drag a selection to select all geometry, **Fig. 37**.

Step 11. Click **Mirror Entities** on the Sketch toolbar.

Step 12. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 13. Add **8.2** dimension, **Fig. 38**.

Step 14. Click OK in the Hole Wizard Property Manager.

Step 15. Save (**Ctrl-S**).

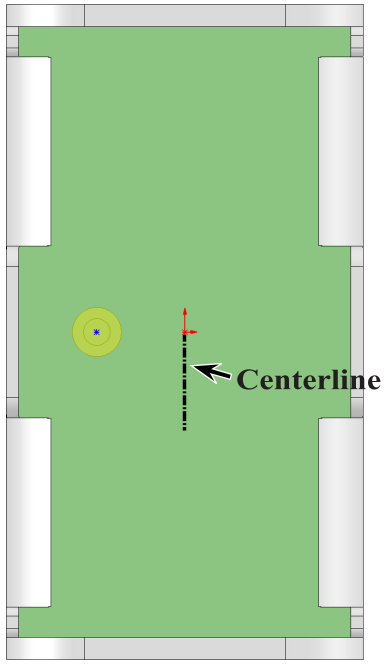

Fig. 36

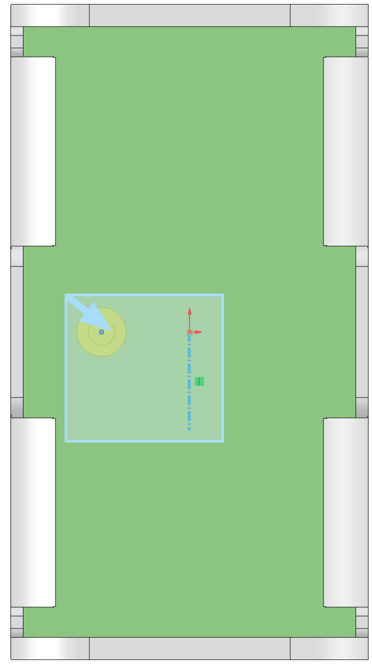

Fig. 37

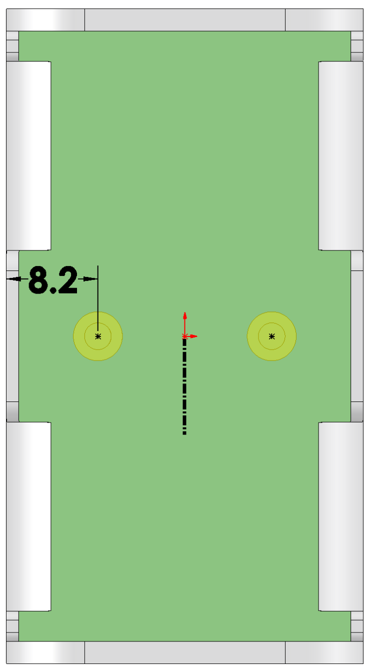

Fig. 38

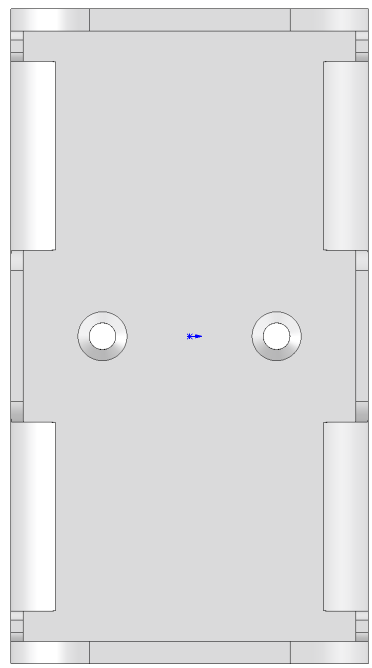

Fig. 39

F. Hole Wizard Rivet Holes.

Step 1. Click **Front** on the Standard Views toolbar. (**Ctrl-1**)

Step 2. Click **Hole Wizard** on the Features toolbar.

Step 3. In the Property Manager on the Type tab set:
under Hole Type, **Fig. 40**
click **Hole**
under Standard:
select **ANSI Metric**
under Type:
select **Drill sizes**
under Hole Specification:
Size: 2.0
under End Condition
End Condition **Through All**
under Options
uncheck **countersinks**

click **Positions tab** at top of the Property Manager.

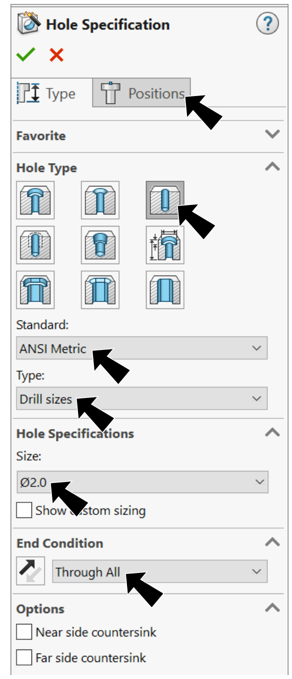

Fig. 33

Step 4. Click **front face of Holder** one time as face for holes and click **face to place a point**, **Fig. 41**.

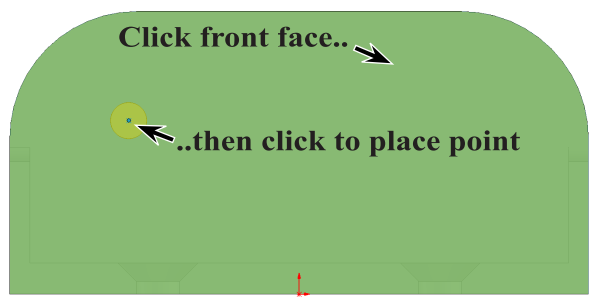

Fig. 41

Step 5. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 6. Sketch **vertical centerline from Origin**, **Fig. 42**.

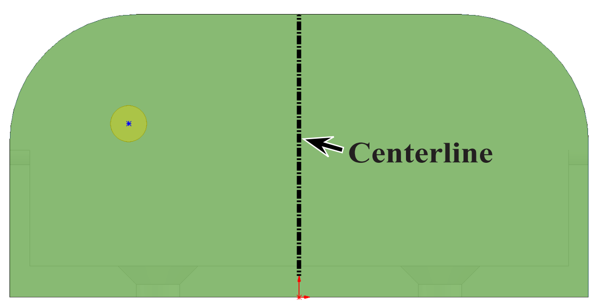

Fig. 42

Step 7. **Unselect Centerline tool**. To unselect, right click graphics area and click Select from menu.

Step 8. Drag selection **to select all geometry**, **Fig. 43**.

Step 9. Click **Mirror Entities** on the Sketch toolbar.

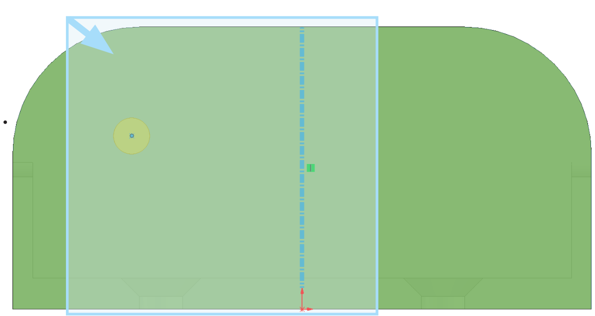
Fig. 43

Step 10. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 11. Add **8.7 and 8.3** dimensions, **Fig. 44**.

Step 12. Click OK in the Hole Wizard Property Manager.

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

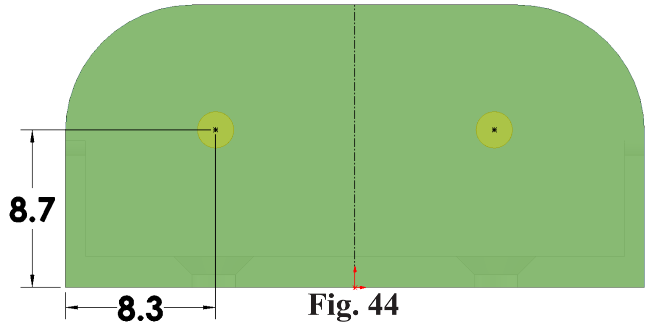

Fig. 44

G. Fillets.

Step 1. Click **Trimetric** on the Standard Views toolbar.

Step 2. Click **Fillet** on the Features toolbar.

Step 3. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 45**

Radius **1**
click **top front edge**, **Fig. 46**

click **Internal to feature 13 Edges** on Fillet pop-up toolbar, **Fig. 52**

click OK .

Step 4. Save (**Ctrl-S**).

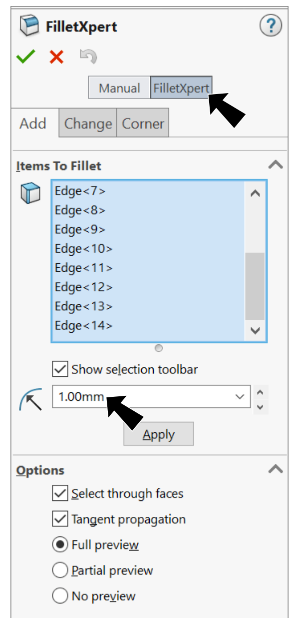

Fig. 45

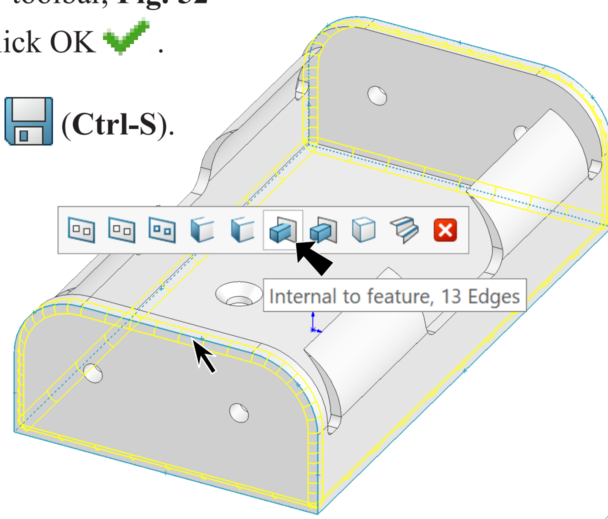

Fig. 46

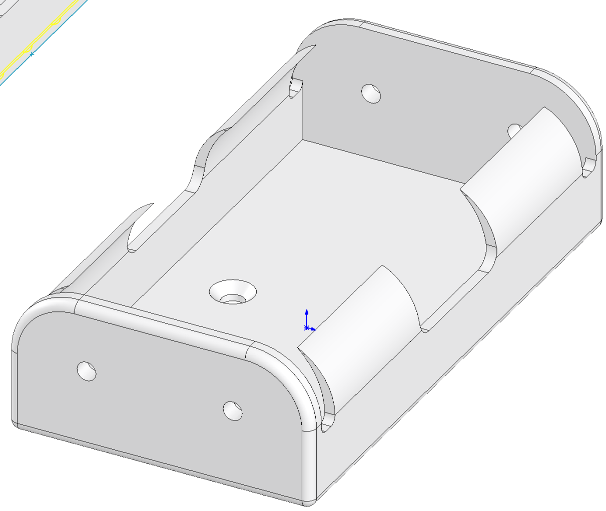

Fig. 47

H. Appearance: Light Gray Plastic.

Step 1. Click Holder to select the part, click **Appearance Callout** on the context toolbar and click **BATTERY...**, **Fig. 48**.

Step 2. In the Appearances Task pane, expand **Plastic**, click **High Gloss** and in the lower pane select **dark gray high gloss plastic**, **Fig. 49**.

Step 3. Over in the Appearances Property Manager, under Color, **Fig. 50**

set **RGB values**

R 115

G 115

B 115

Click OK in Property Manager.

Step 4. Save **(Ctrl-S)**.

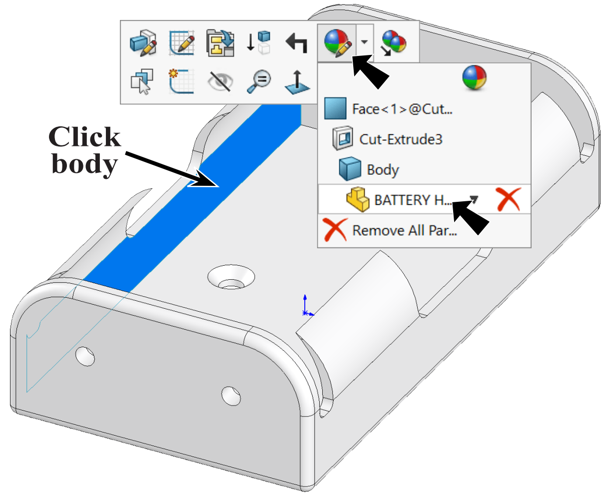

Fig. 48

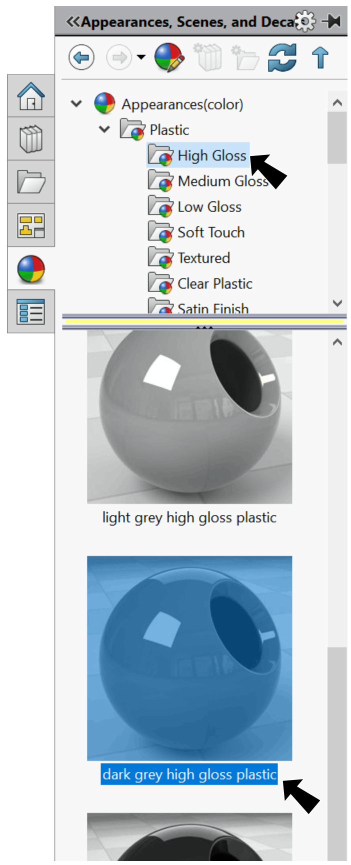

Fig. 49

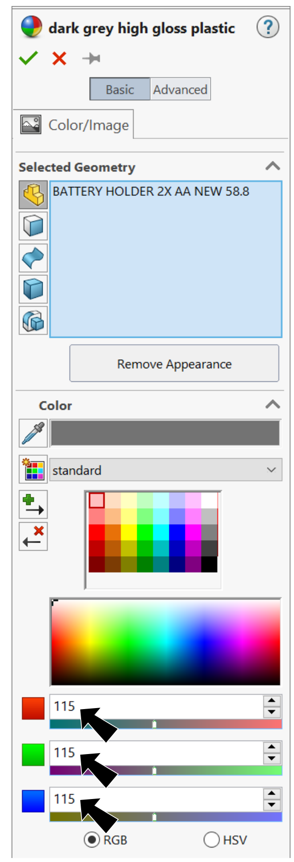

Fig. 50

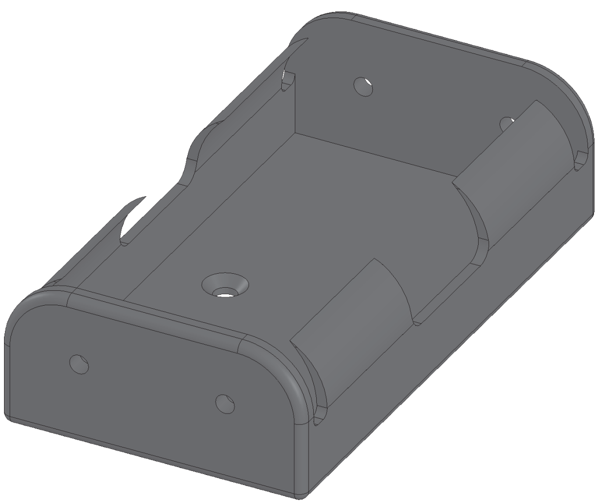

Fig. 51