

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



### 1 Project 3 - Air Cover Part

#### 1.1 Project 3

This project focuses on advanced sketching methods. Shell and sweep features are also introduced.



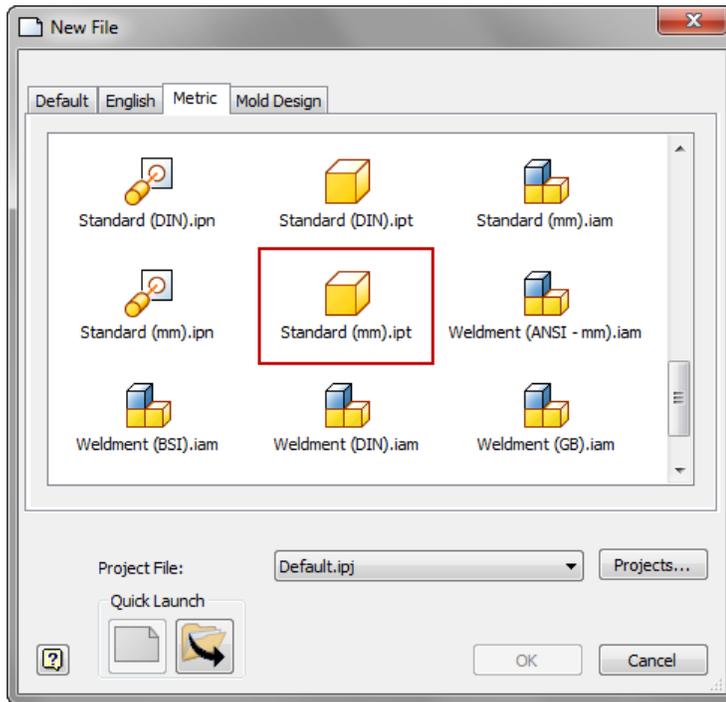
- 1: Create a new part using the *Standard (mm).ipt* template.
  - On the **Quick Access** toolbar, click **New**.



- In the **New File** dialog box, click the **Metric** tab.
- Select *Standard (mm).ipt*.

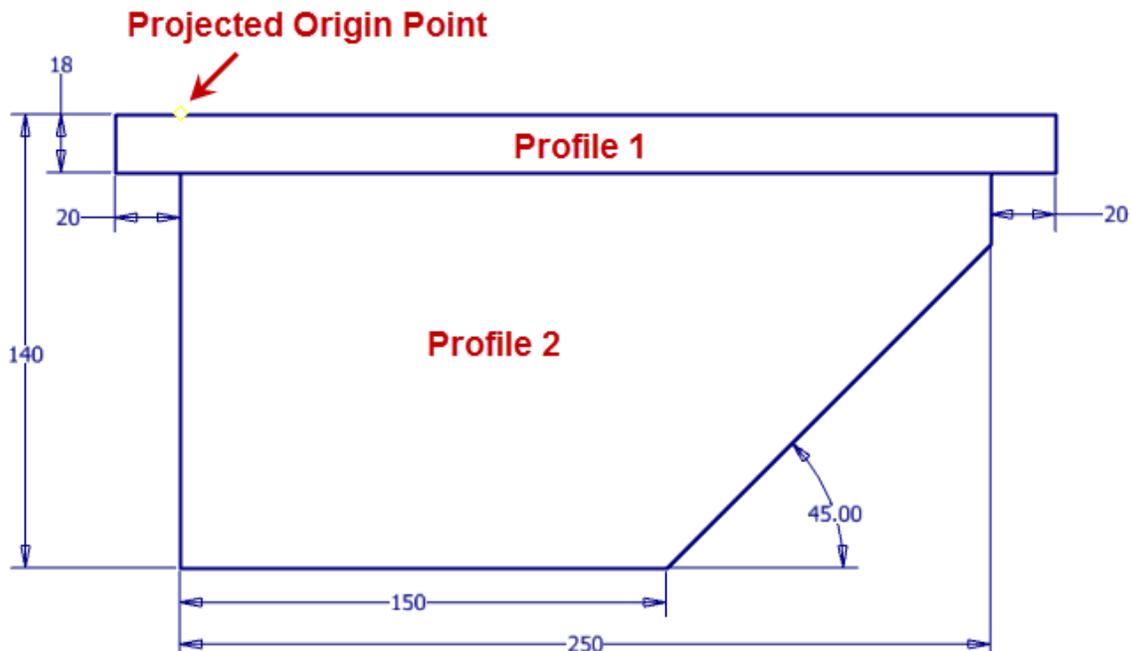
# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Click **OK**.

- 2: In the active sketch, sketch the following full constrained profiles. Make sure you have 2 profiles in the one sketch as shown. Also note the position of the projected origin point; this will position the origin planes so that they can be used for creating features.

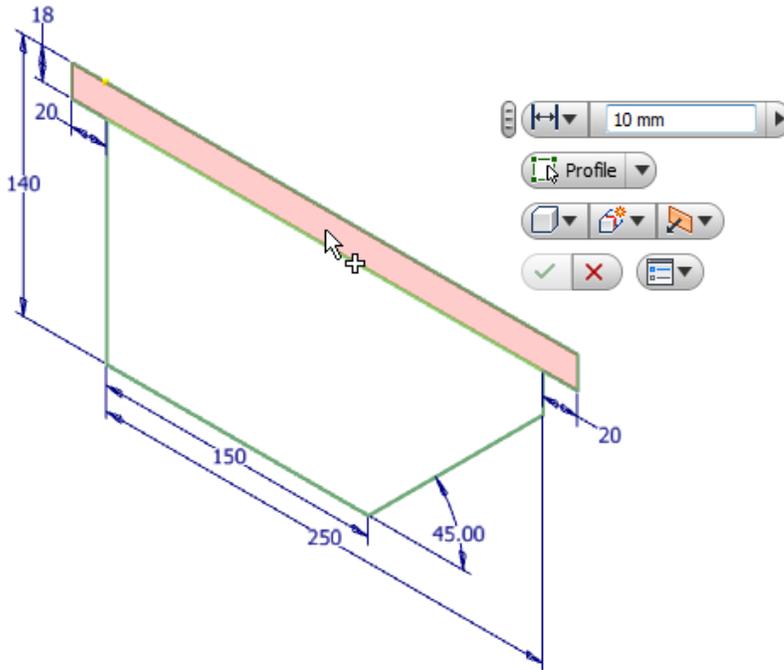


# ME 24-688 – Week 2

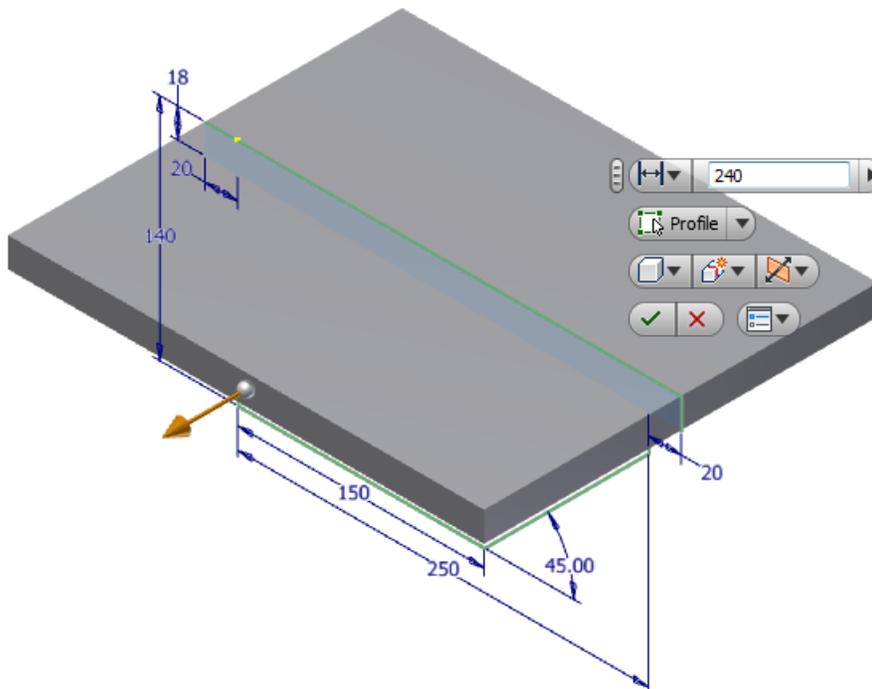
## Project 3 – Air Cover Part



- 3: Create main part body
  - Start the **Extrude** tool
  - Select the upper profile



- Select the **Symmetric** direction. Drag the direct manipulation arrow, or enter **240 mm** into the Mini-Toolbar for the extrusion length. Click **OK**

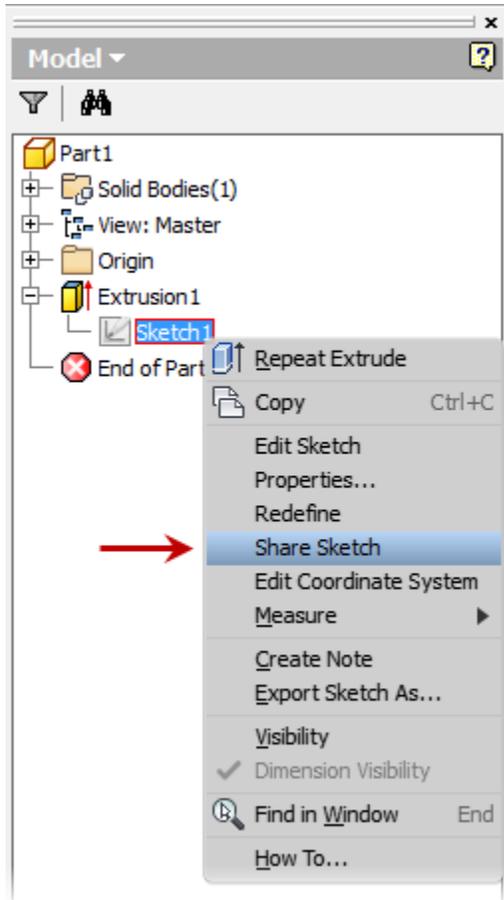


# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- In the browser expand *Extrusion1* and right-click on the consumed sketch. Select **Share Sketch** from the shortcut menu.



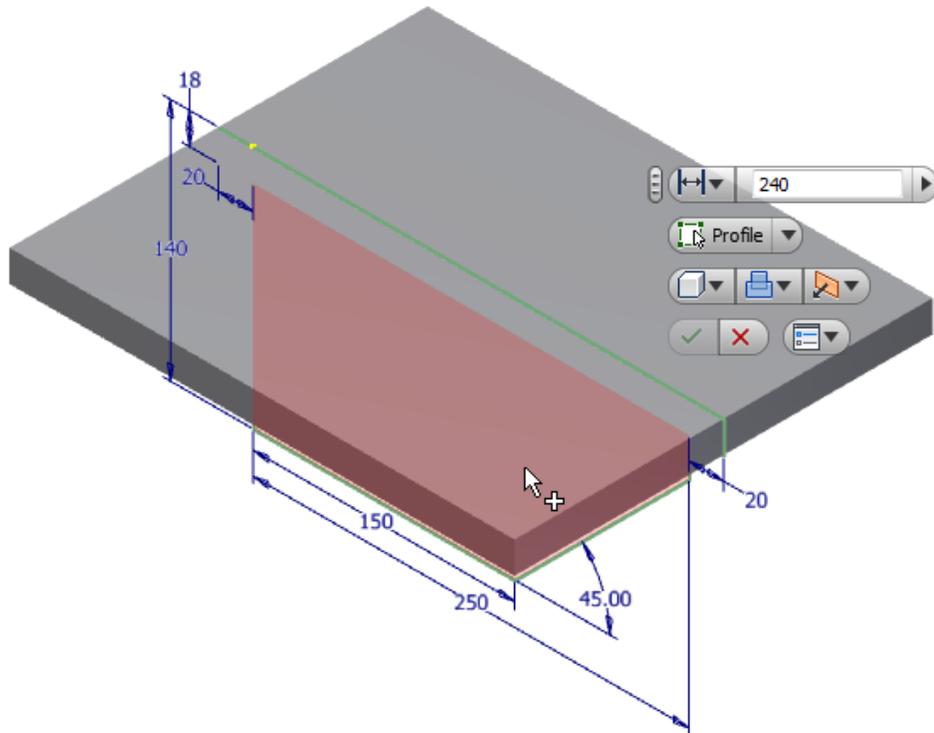
*Sketch1* is now available for use in more than one feature

# ME 24-688 – Week 2

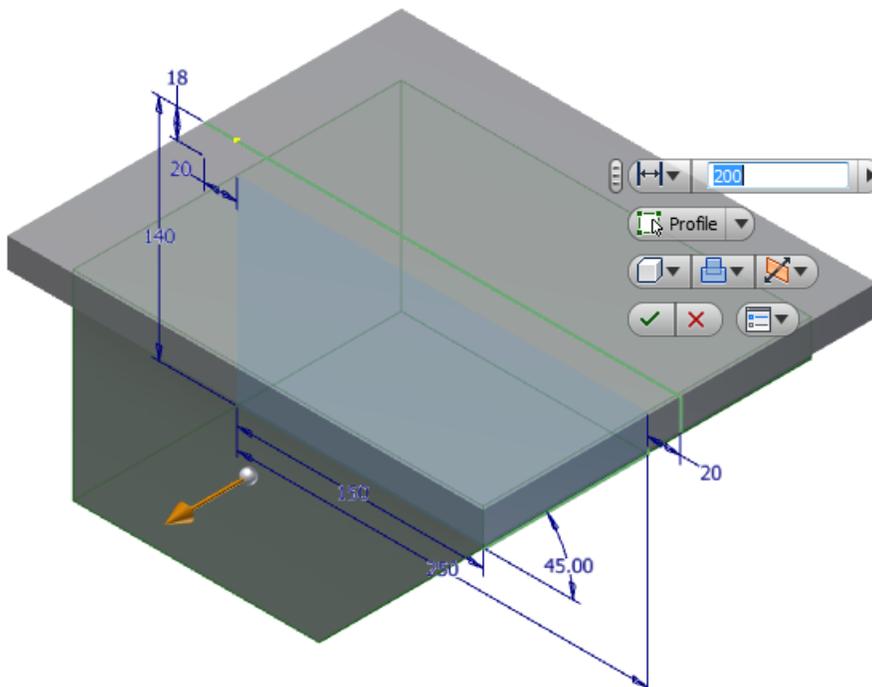
## Project 3 – Air Cover Part



- Start the **Extrude** tool  
Select the lower profile



- Select the **Symmetric** direction. Drag the direct manipulation arrow, or enter **200 mm** into the Mini-Toolbar for the extrusion length.  
Click **OK**

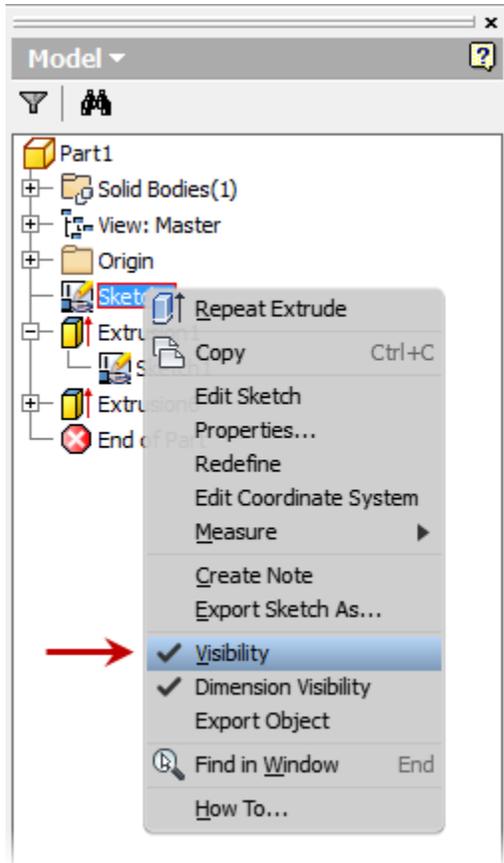


# ME 24-688 – Week 2

## Project 3 – Air Cover Part



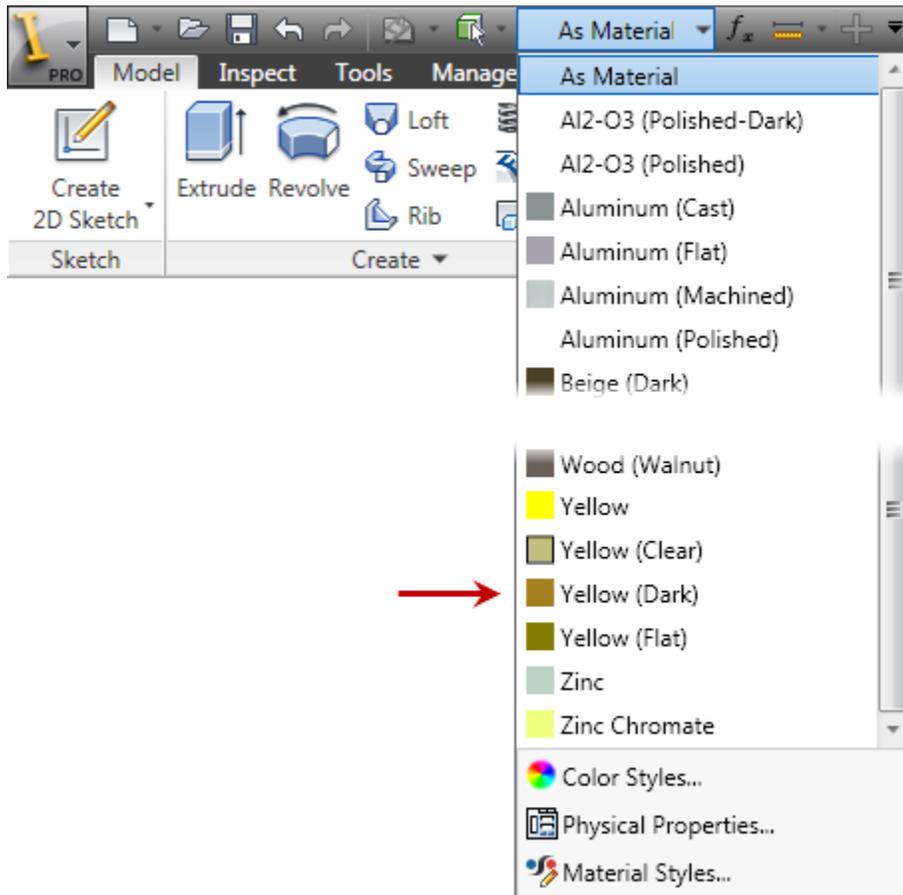
- In the browser, right-click *Sketch1*.  
Select **Visibility** from the shortcut menu to turn off the sketch in the graphics window.



- 4: Change Part Color  
On the **Quick Access** Toolbar pick **Yellow (Dark)** from the part color drop down list.

# ME 24-688 – Week 2

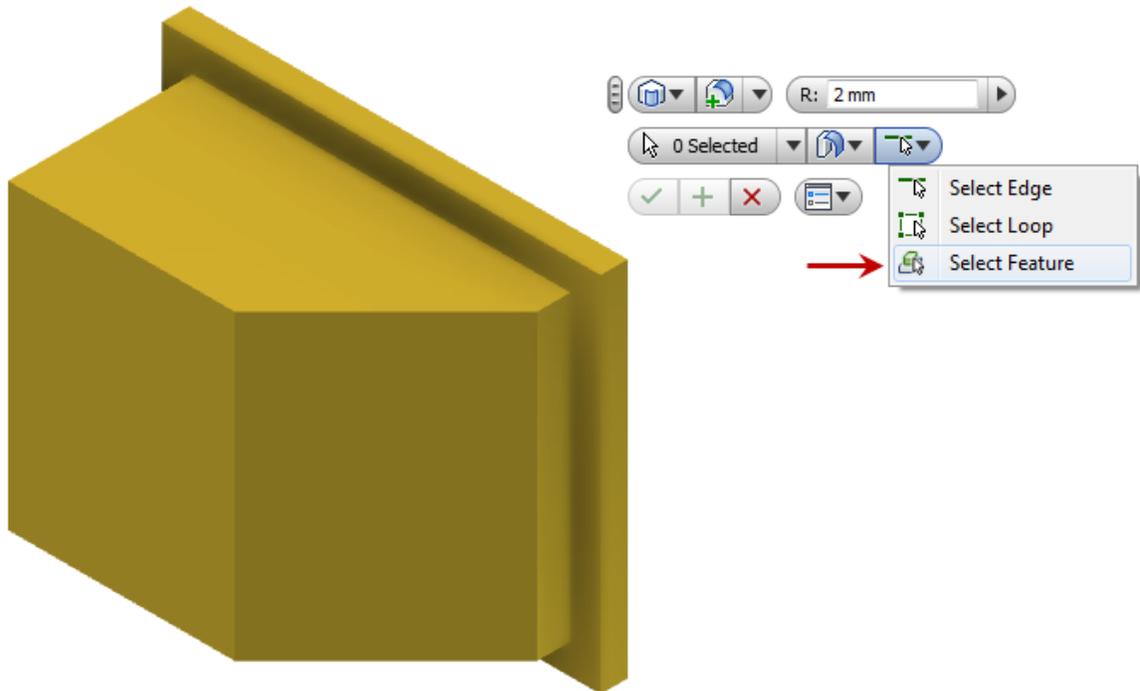
## Project 3 – Air Cover Part



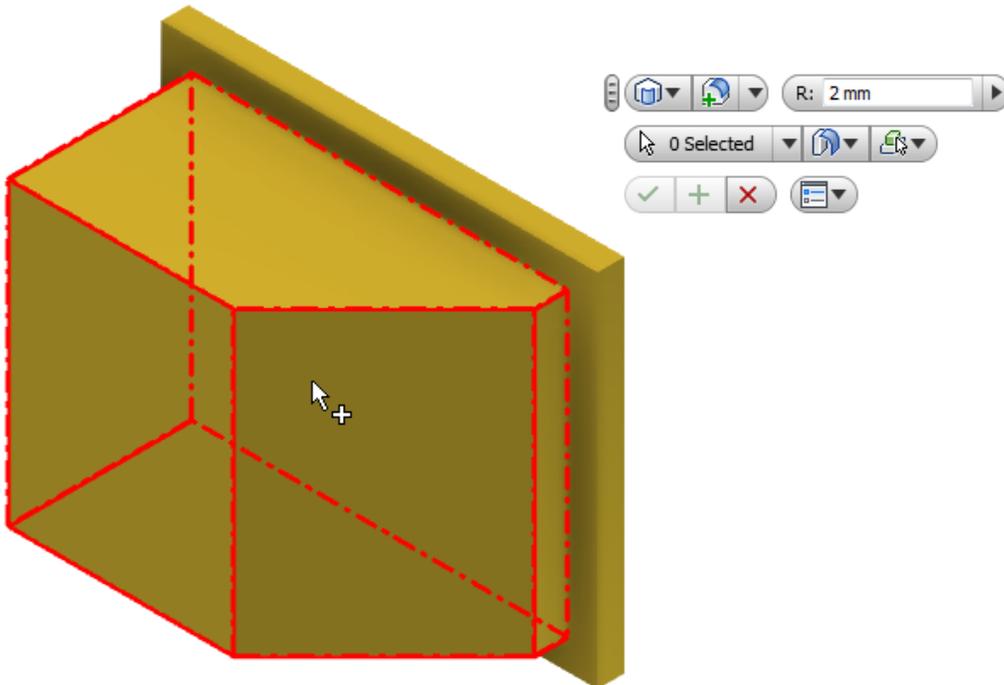
- 5: Add feature fillet
  - Start the **Fillet** tool
    - On the Mini-Toolbar pick the **Select Feature** option

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Select the second feature you created (*Extrusion2*)

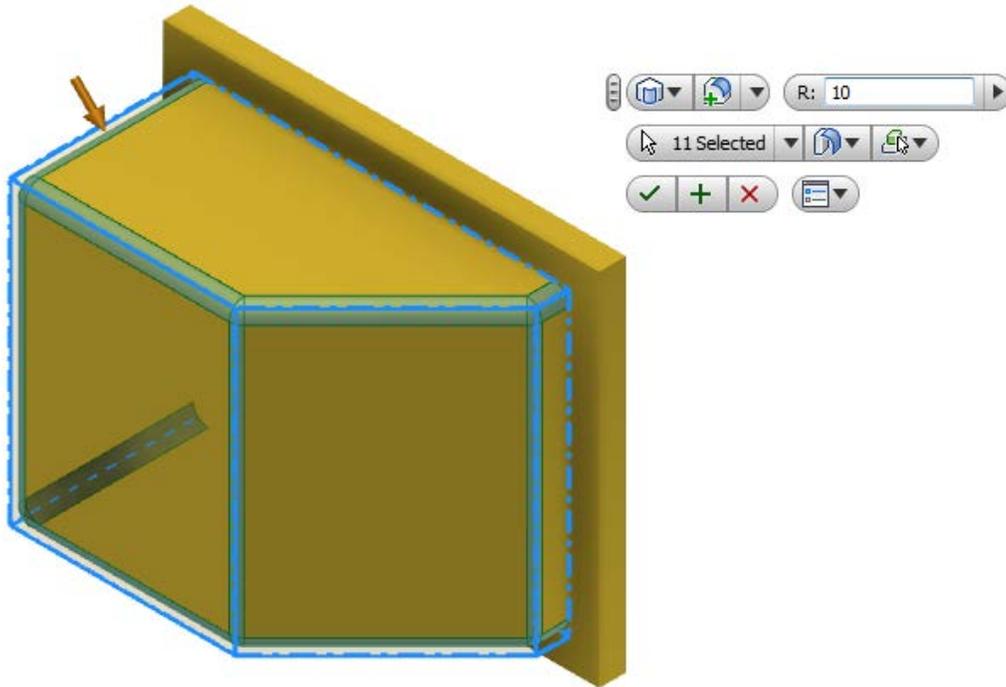


- Enter a radius of **10 mm** into the Mini-Toolbar  
Notice that all edges of the feature have been selected

Click **OK**

# ME 24-688 – Week 2

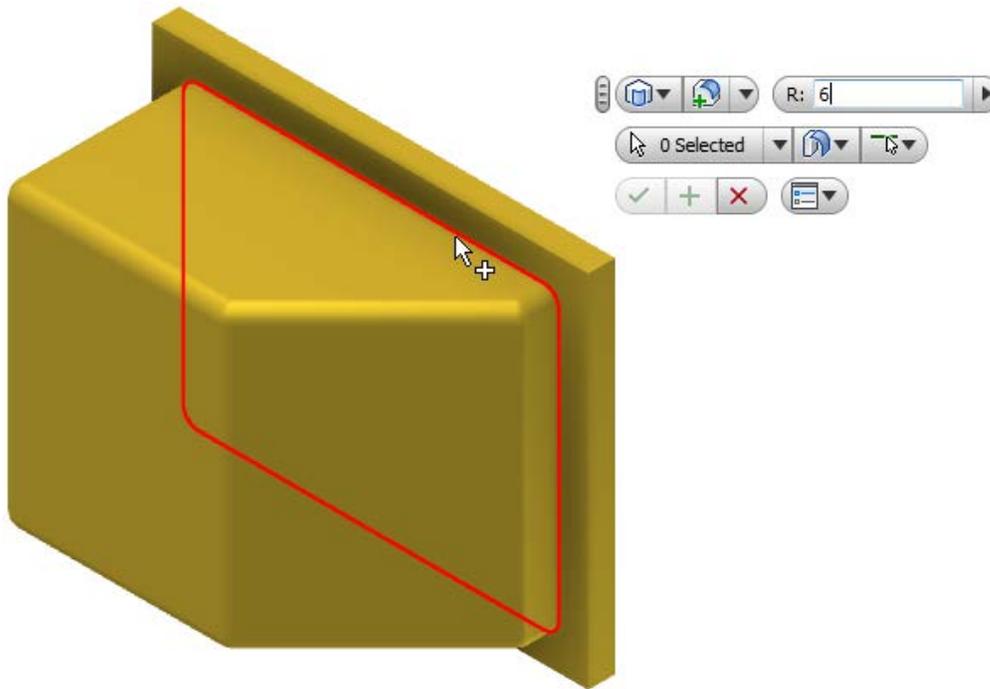
## Project 3 – Air Cover Part



- 6: Add additional fillets
  - Start the Fillet tool
    - Select the edge between *Extrusion1* and *Extrusion2*
    - Notice that this edge is treated as a continuous loop because the fillet placed in the last step
    - Enter **6 mm** in the Mini-Toolbar
  - Click **Apply**

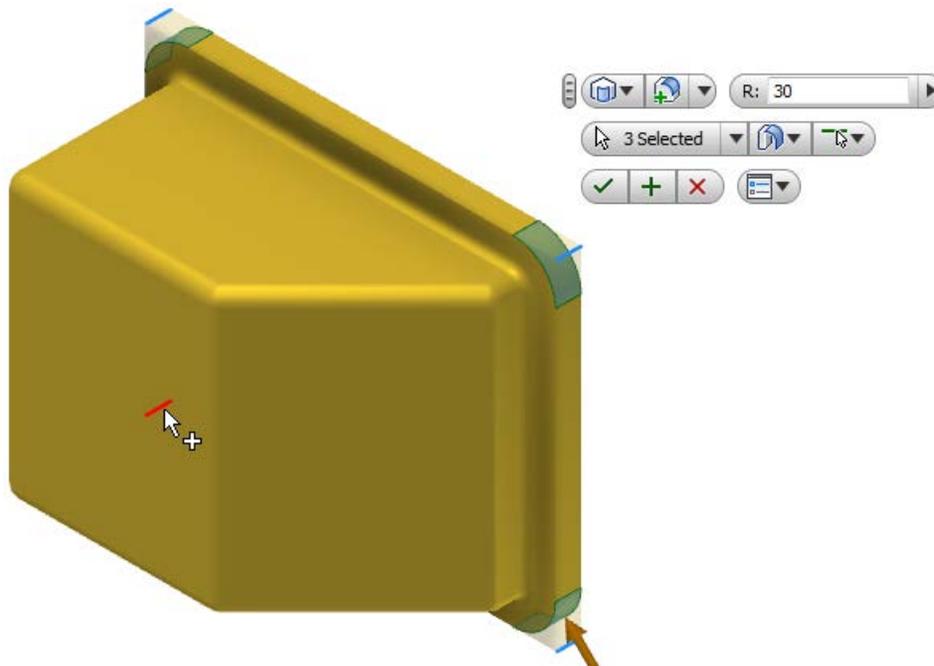
# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Enter a radius of **30 mm** into the Mini-Toolbar  
Select the four corners of the upper feature (*Extrusion1*)  
Notice that you can select edges that are not visible in the current view by hovering over different parts of the model.

Click **OK**



# ME 24-688 – Week 2

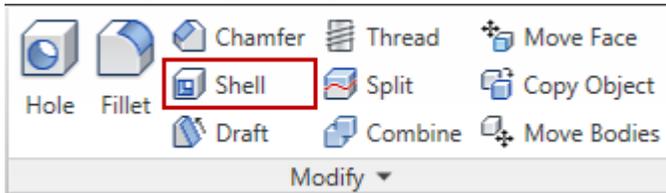
## Project 3 – Air Cover Part



### 7: Create Shell feature

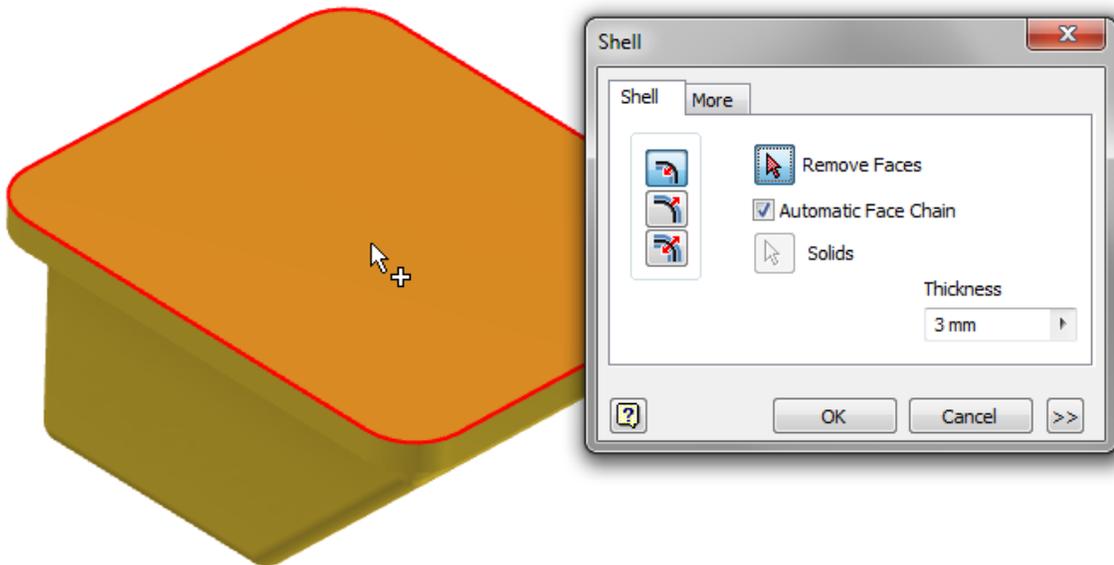
- Start the **Shell** tool

Model Tab | Modify Panel | Shell



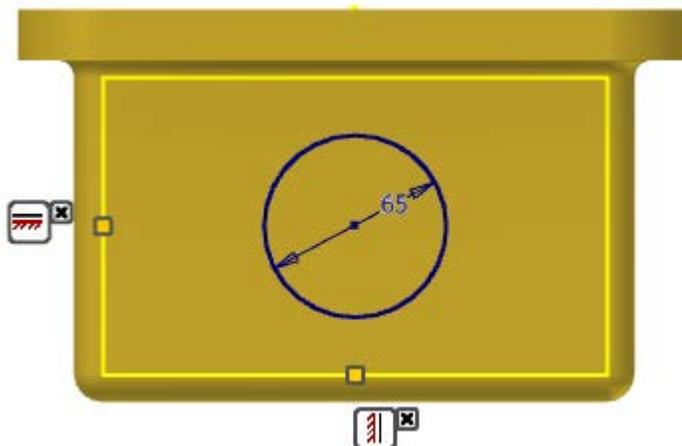
- In the **Shell** Dialog Box enter **3 mm** for the **Thickness** option  
Select the top surface of the part for **Remove Faces**

Click **OK**



### 8: Add boss extrusion

- Create a new sketch on the left side flat surface  
Create a constrained circle as shown

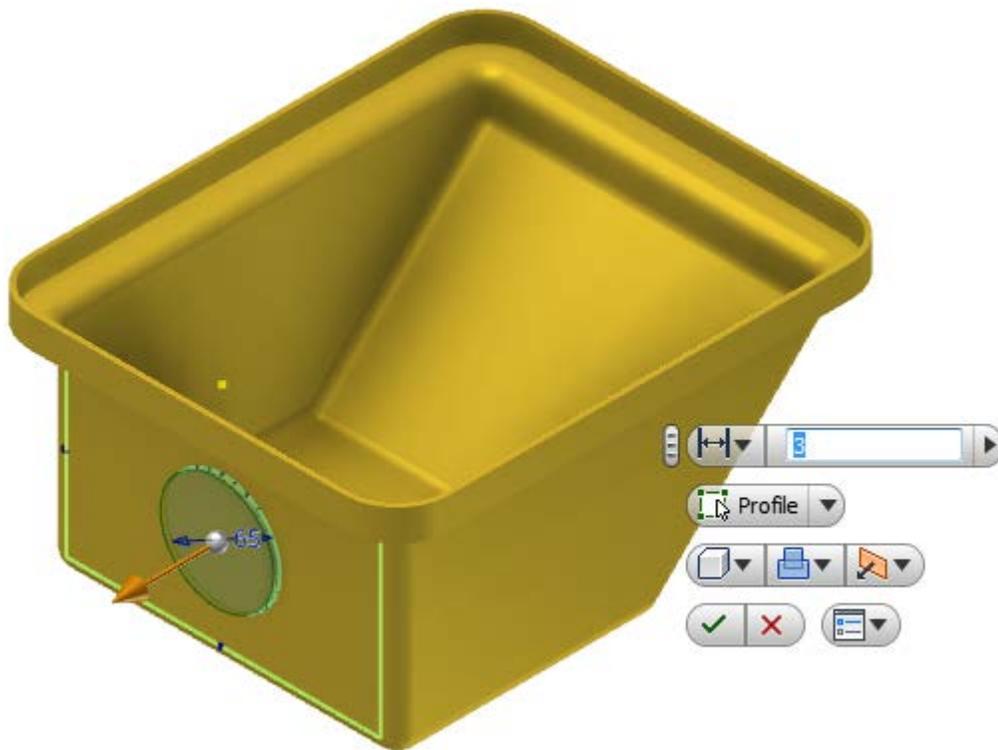


# ME 24-688 – Week 2

## Project 3 – Air Cover Part



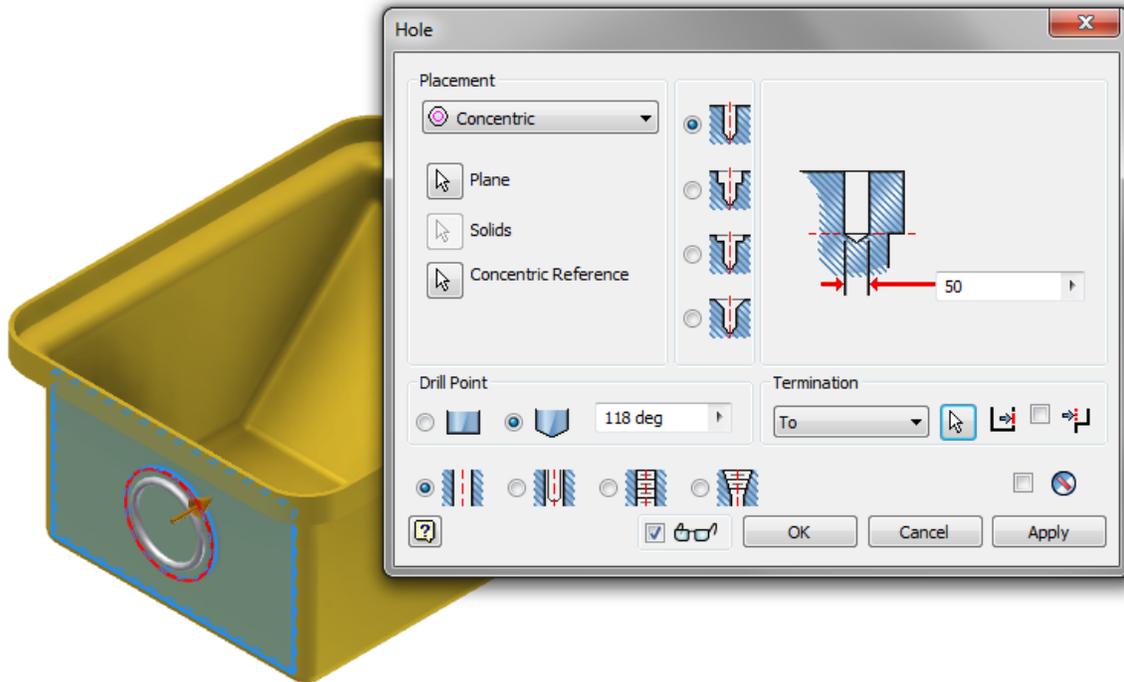
- Start the **Extrude** tool  
Extrude the profile 3 mm



- 9: Add Hole
- Start the **Hole** tool  
Create a **Concentric** hole on the previous extrusion  
**50 mm** diameter  
**To** inside face

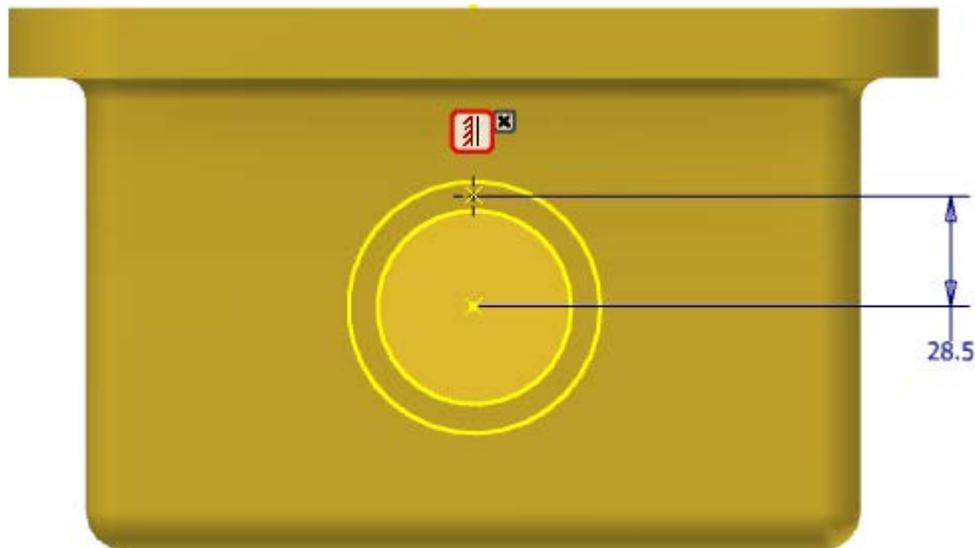
# ME 24-688 – Week 2

## Project 3 – Air Cover Part



### 10: Add bolt pattern

- Create a new sketch on the boss extrusion  
Sketch the point as shown



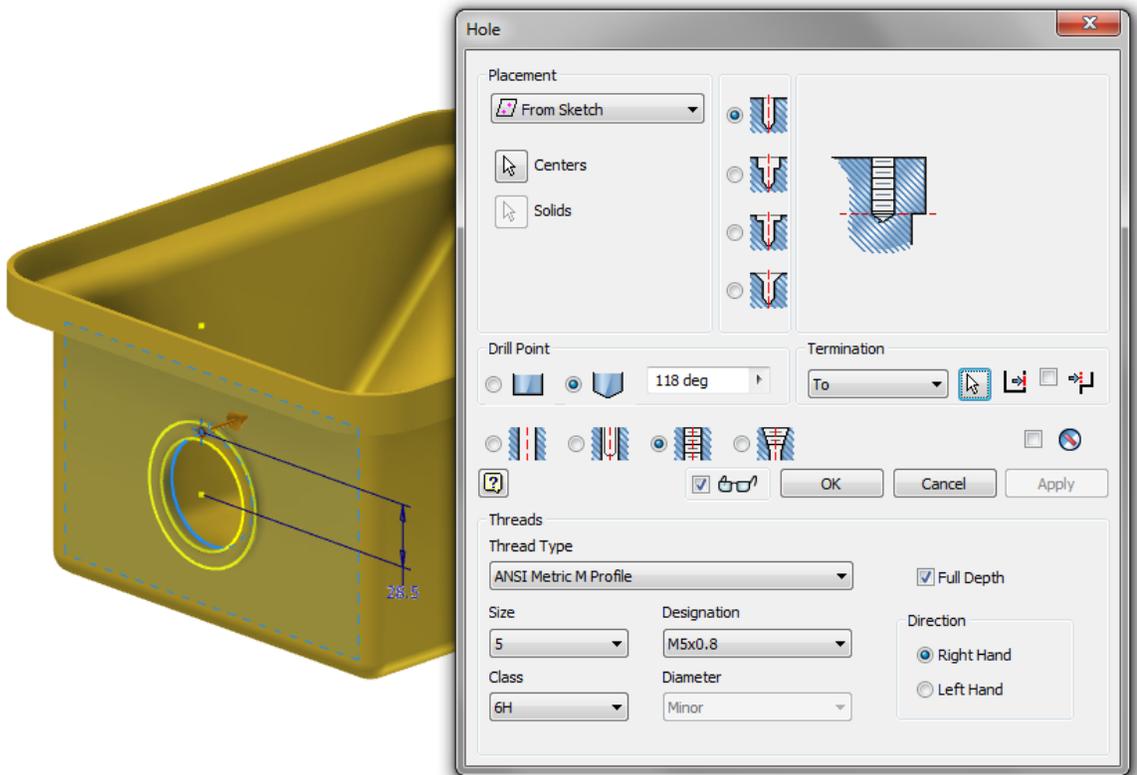
- Start the **Hole** tool  
Create a **From Sketch** tapped hole  
Type: **ANSI Metric M Profile**  
Size: **5**  
Designation: **M5x0.8**  
Termination: **To**

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



Select the inside face for the To Termination  
Click **OK**

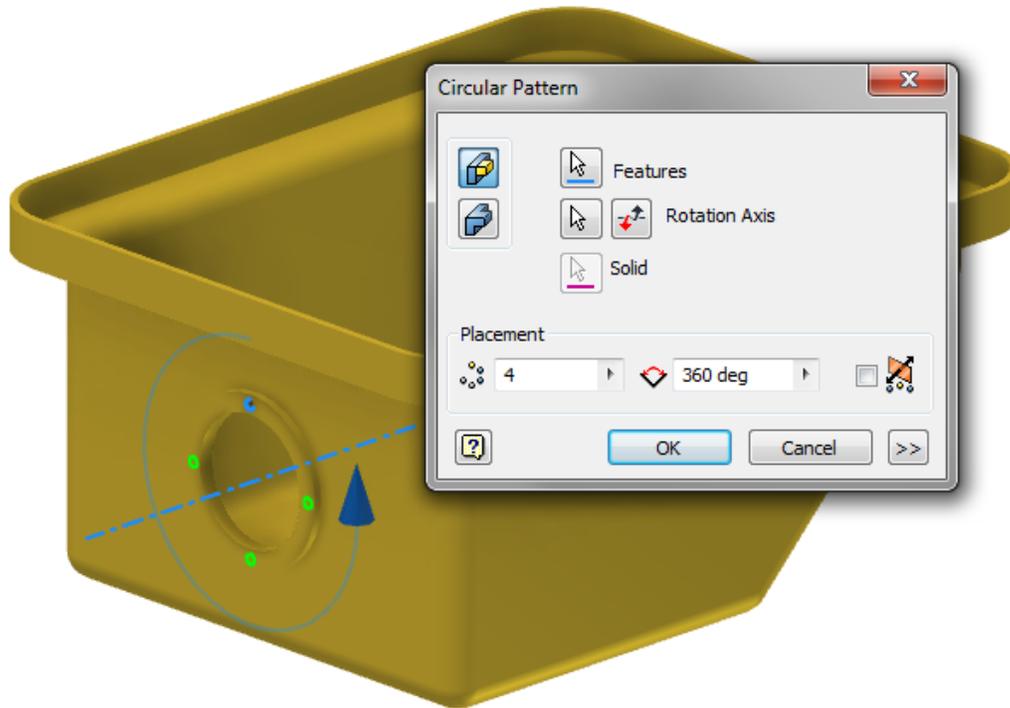


- Start the **Circular Pattern** tool  
Select the M5 tapped hole feature  
Select the outside diameter of the boss extrusion  
Enter Pattern Placement: **4**  
Angle: **360 deg**

Click **OK**

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



### 11: Create ribs on the model

- Start the **Work Plane** tool
- Click-hold the left outer surface of the part

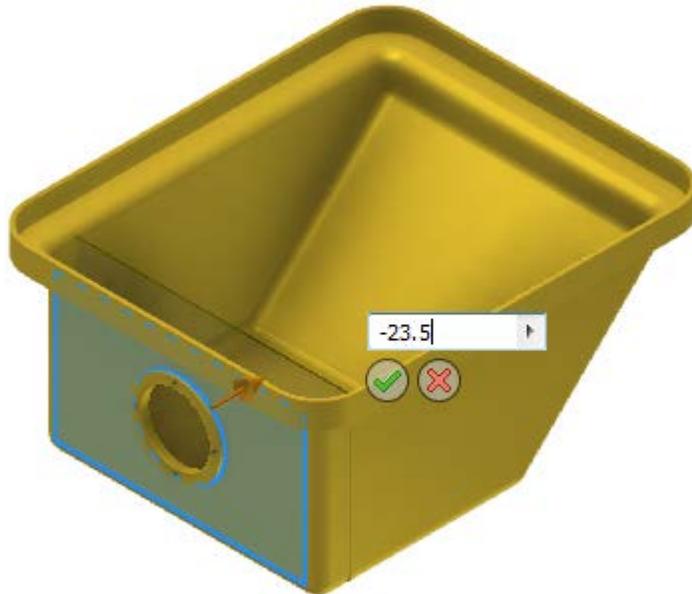


# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Drag to the right -23.5 mm  
Click **OK**



- Click **OK**
- Project reference part edges into the sketch at the point where the sketch cuts through the part using the **Project Cut Edges** tool
- Click **F7 (Slice Graphics)** to show sketch.
- Sketch the following profile



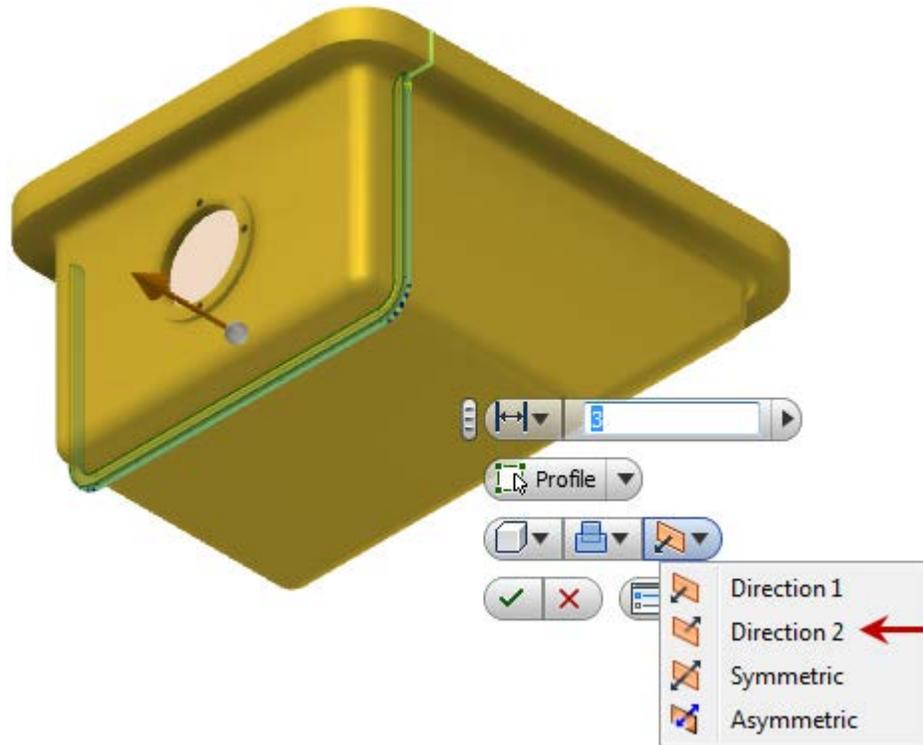
Exit Sketch

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Start the **Extrude** tool
  - Select the sketch profile
  - Enter 3mm in the direct entry field
  - Select the **Direction 2** option
  - Click **OK**



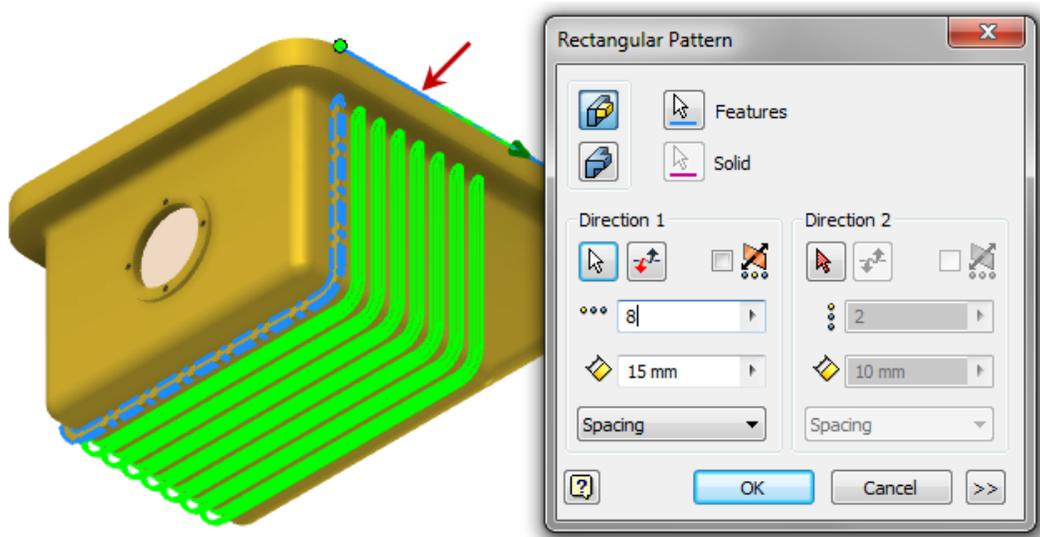
# ME 24-688 – Week 2

## Project 3 – Air Cover Part



### 12: Pattern extruded rib feature

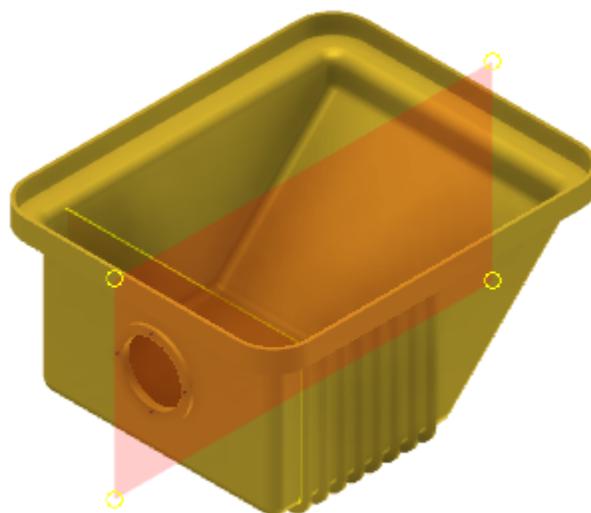
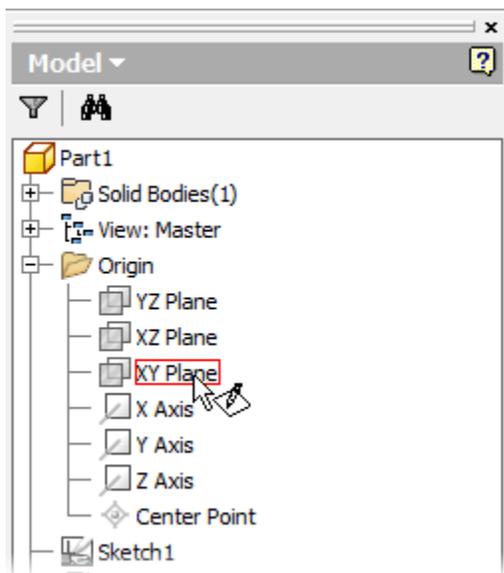
- Start the **Rectangular Pattern** tool
- Select the extruded rib feature  
Select the top edge of the part for **Direction 1**  
Column Count: **8**  
Column Spacing: **15 mm**



- Click **OK**

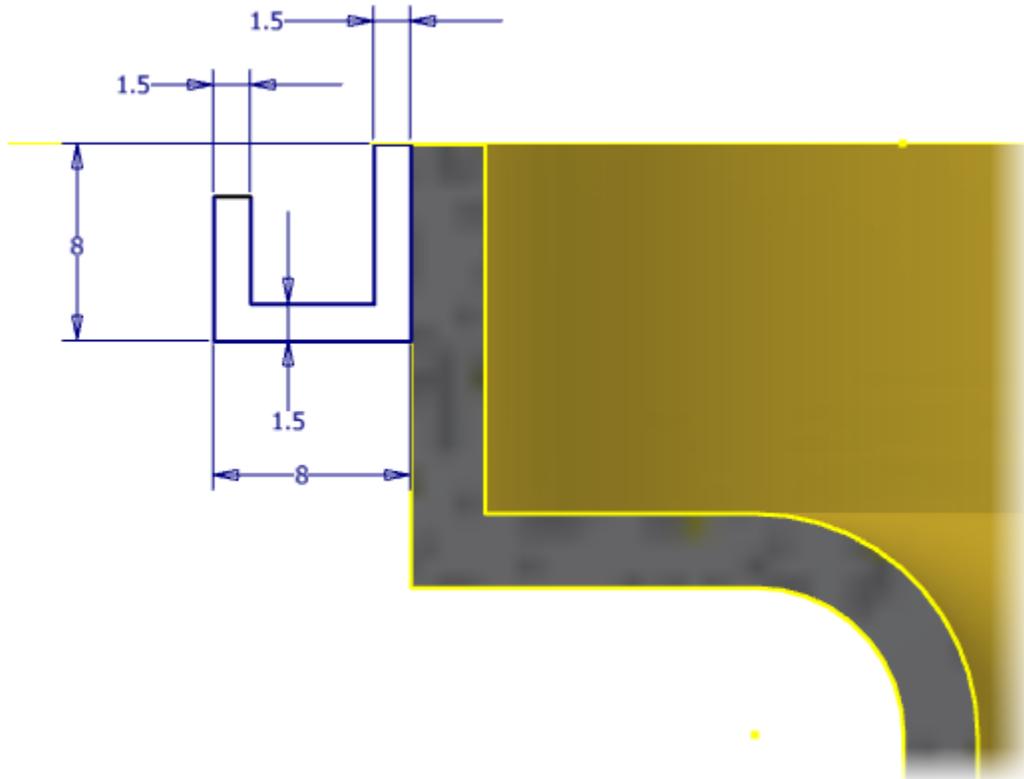
### 13: Create Sweep feature

- Create a new Sketch  
Click the **XY Plane** from the browser



## Project 3 – Air Cover Part

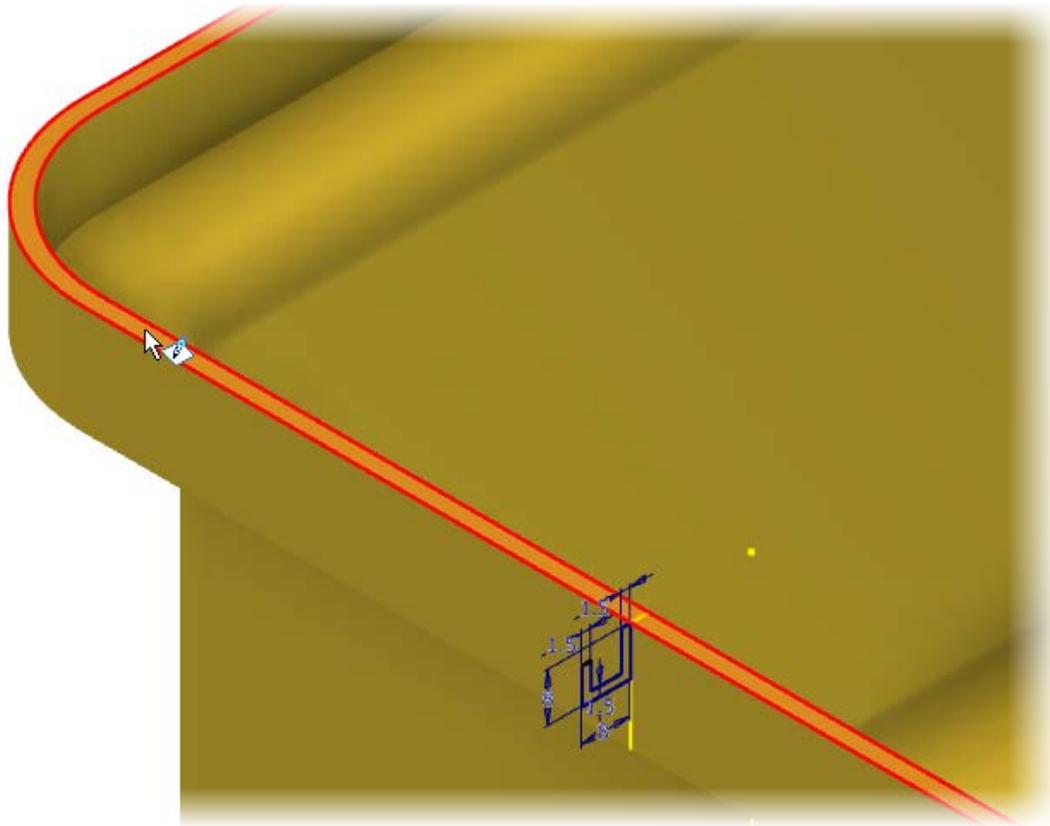
- Project reference part edges into the sketch at the point where the sketch cuts through the part using the **Project Cut Edges** tool
- Click **F7 (Slice Graphics)** to show sketch.
- Sketch the following closed profile



- Exit the Sketch
- Create a new Sketch  
Select top surface

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



If top edges are not automatically projected into the sketch use the **Project Geometry** tool to project the top edges.

- Exit the Sketch
  - Start the Sweep tool
- Model tab | Create panel | Sweep**



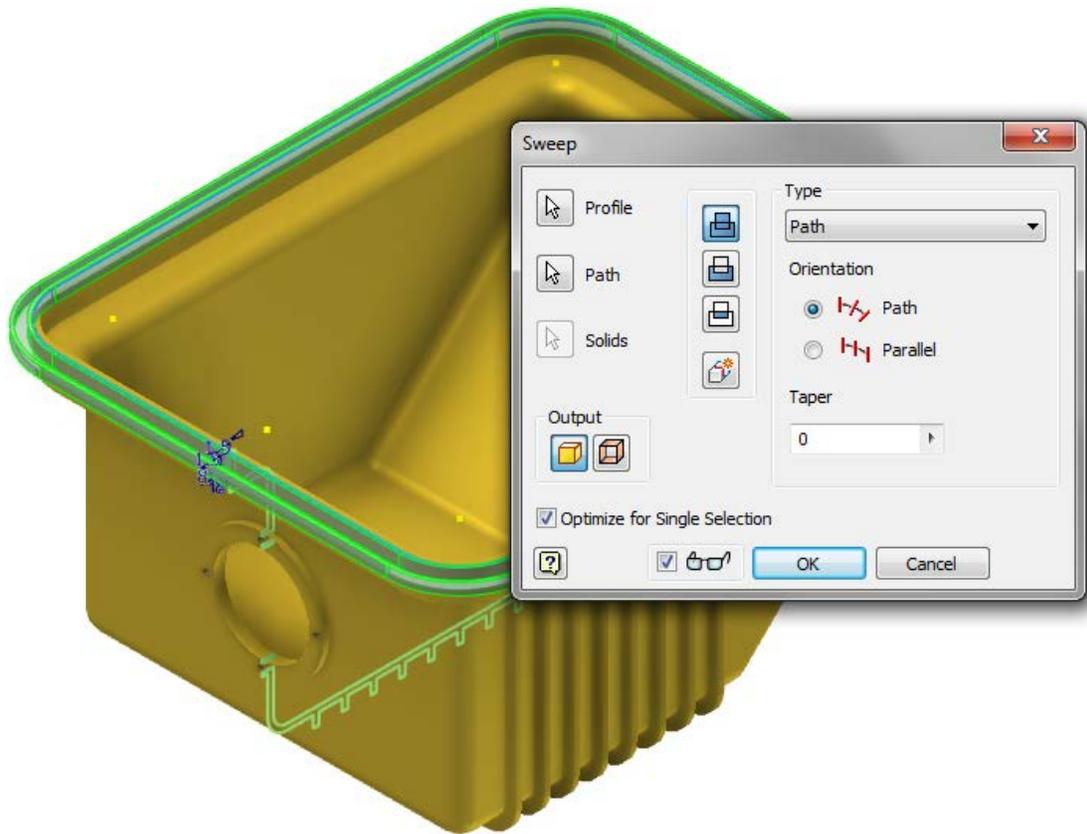
- Select the sketched profile from the first sketch for the **Profile**

# ME 24-688 – Week 2

## Project 3 – Air Cover Part



- Select the projected edge from the second sketch for the **Path**



- Click **OK**

### 14: Save Part

- On the **Quick Access** toolbar, click **Save**.



- In the **Save As** dialog box, enter file name *AirCover.ipt*
- Click **Save**