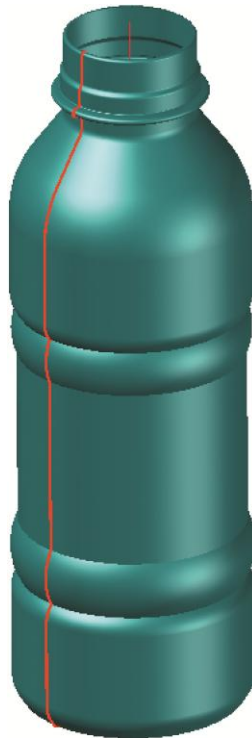


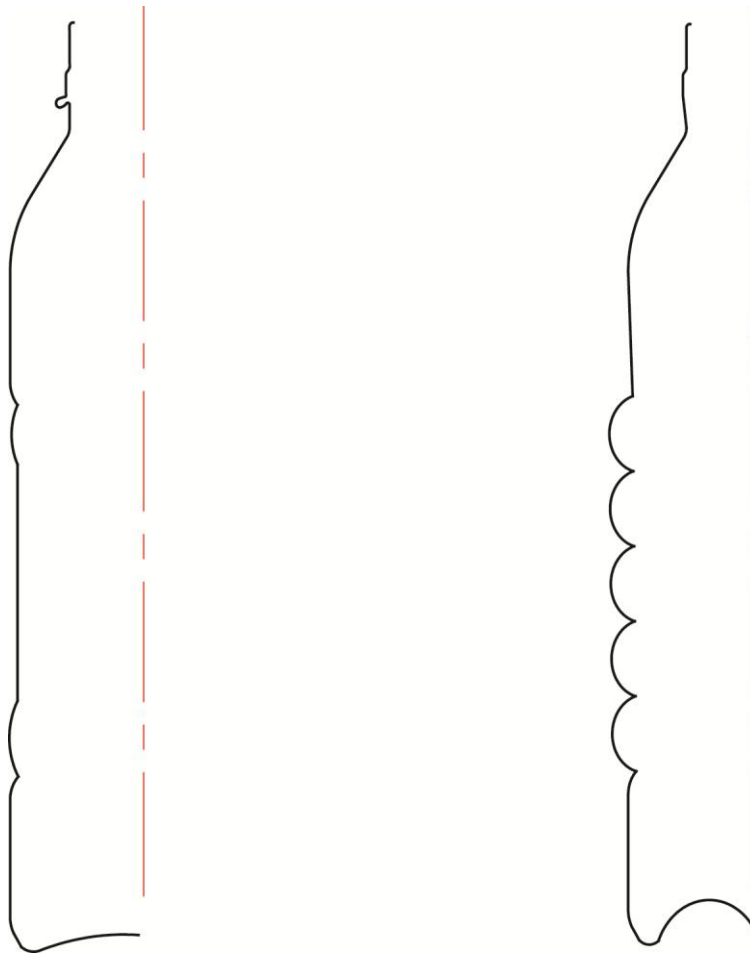
## Exercise 10-13

In this exercise, a plastic water bottle will be reverse engineered from an existing water bottle surface model. You will extract isolines using the **SURFEXTRACTCURVE** command, edit the extracted curves, and revolve the new profile to create the new design. You will then create an alternate version of the design by extracting curves and creating a loft surface. You will also modify a surface model of a guitar using the **SURFEXTRACTCURVE** command.

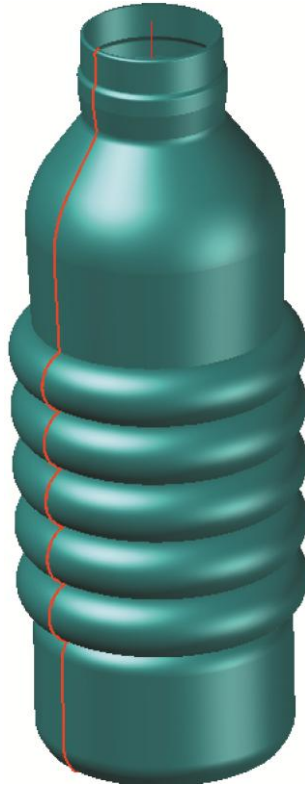
1. Open the drawing EX10\_13A.dwg available on the companion website.
2. Set the Extracted\_Curves layer current.
3. Using the **SURFEXTRACTCURVE** command, select the surface of the water bottle. Set the curve direction along the longitude of the bottle. Use the **Chain** option to extract a single polyline curve. See the illustration below.



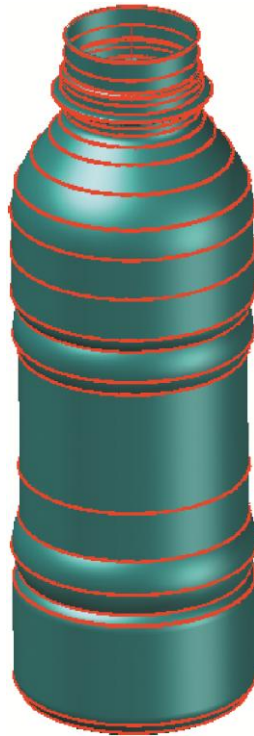
4. Using the view cube, set the front view current. Erase the existing water bottle surface model. Edit the curve shown on the left in the illustration below to create a new curved shape for the profile of the bottle. You can use grips to edit the polyline. You can also explode the polyline, edit the individual segments, and then join the segments to create a single profile. An example of the edited curve is shown on the right in the illustration below.



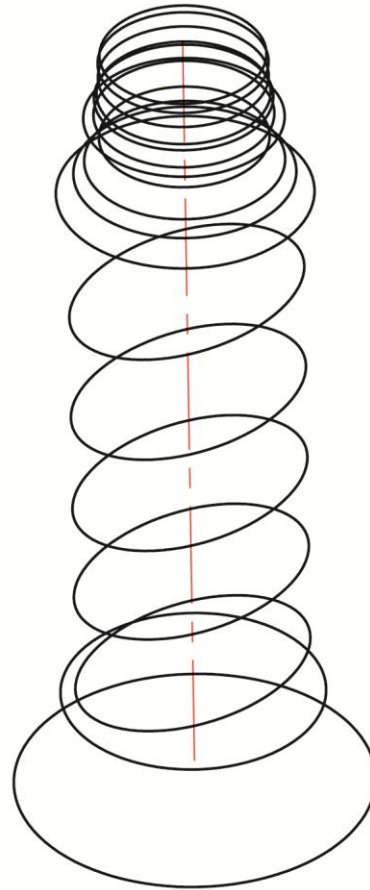
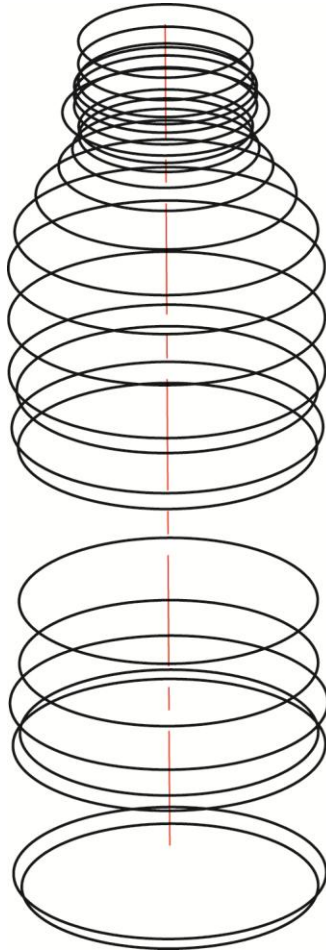
5. Make sure the **SURFACEMODELINGMODE** system variable is set to 0 (the default setting).
6. Set the Bottle layer current. From the **Create** panel on the **Surface** tab of the ribbon, select **Revolve**. Revolve the polyline 360° to create the new water bottle. See the illustration below.
7. Save the drawing as EX10-13A.



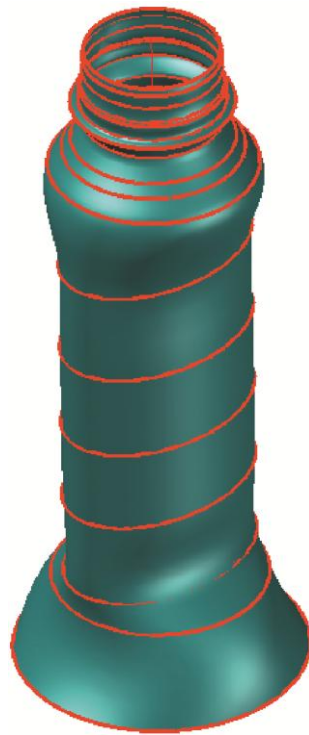
8. Open the drawing EX10\_13B.dwg available on the companion website. This is the original model of the water bottle.
9. Set the Extracted\_Curves layer current.
10. Using the **SURFEXTRACTCURVE** command, select the surface of the water bottle. Set the curve direction along the diameter of the bottle. Extract curves along the height of the bottle as shown in the illustration below. Do *not* use the **Chain** option.



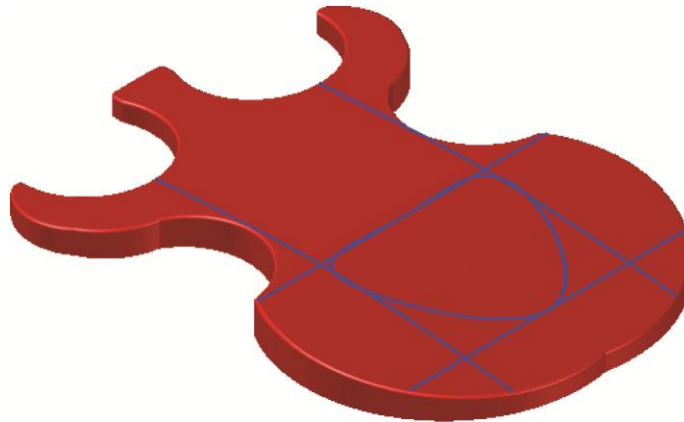
11. Using the view cube, set the home view current. Erase the existing water bottle surface model. Edit the curves shown on the left in the illustration below by changing diameters. You can use grips to stretch the profiles. You can also subtract some of the curves or add ellipses to the design to change the cross-sectional profile shapes. Continue to edit the profiles to create a new unique bottle shape. See the illustration on the right below.



12. Make sure the **SURFACEMODELINGMODE** system variable is set to 0 (the default setting).
13. Set the Bottle layer current. From the **Create** panel on the **Surface** tab of the ribbon, select **Loft**. Loft the profiles to create the new water bottle. See the illustration below.
14. Save the drawing as EX10-13B.



15. Open the drawing EX10\_13C.dwg available on the companion website.
16. Set the Extracted\_Curves layer current. Using the view cube, set the home view current.
17. Using the **Spline points** option of the **SURFEXTRACTCURVE** command, draw a closed spline curve for creating an opening on the top of the guitar. Use the existing extracted isolines to help construct the spline. See the illustration below.



18. Using the **SURFTRIM** command, trim the center area using the closed spline as the cutting curve. See the illustration below.
19. As an option, edit the opening to create different shapes. Select the spline curve and use the control vertices to form different opening shapes.
20. Save the drawing as EX10-13C.

