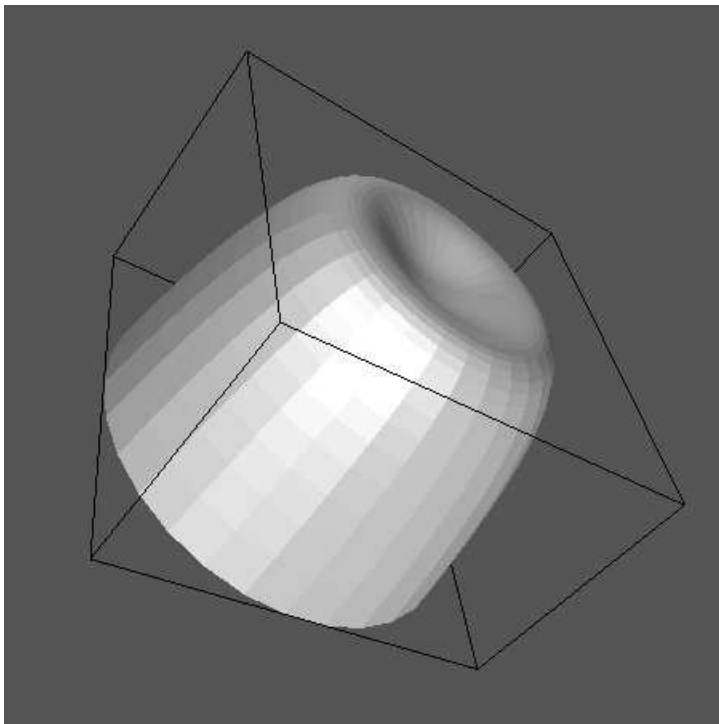


Maxima 5.13.0 <http://maxima.sourceforge.net>
Using Lisp GNU Common Lisp (GCL) GCL 2.6.7 (aka GCL)
Distributed under the GNU Public License. See the file COPYING.
Dedicated to the memory of William Schelter.
This is a development version of Maxima. The function `bug_report()`
provides bug reporting information.

This document recreates the Maple worksheet done for Honors Calculus II on January 22, 2010 using the free software `texmacs`, `geomview` and Maxima running on Linux.

The following plot command visualizes the volume of the area of the curve $y = 8 - x^4 + 2x^2$ rotated about the y axis. The output from Maxima is sent to the file `img-01-22.gv` and displayed using `geomview` for 3D visualization. After this the area is computed by means of an integral.

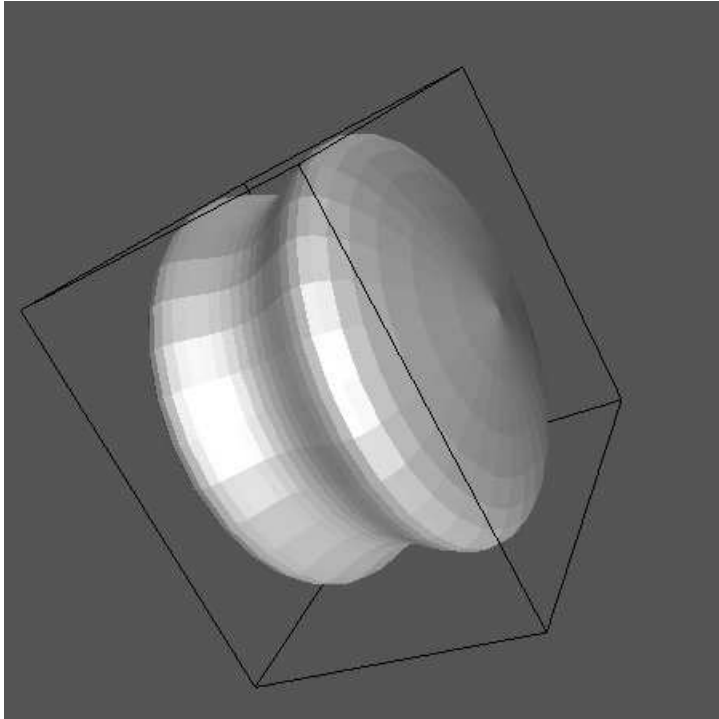
```
(%i1) scale:0.3$  
      plot3d([r*cos(theta),r*sin(theta),scale*(8-r^4+2*r^2)],  
            [r,0,2],[theta,0,2*%pi],  
            [plot_format,geomview],[run_viewer,false])$  
      system("mv ~/maxout.geomview img-01-22.gv")$  
(%i101) system("geomview img-01-22.gv &")$
```



```
(%i108) integrate(2*%pi*x*(8-x^4+2*x^2),x,0,2);  
(%o94)  $\frac{80\pi}{3}$   
(%i95) float(%);  
(%o65) 83.77580409572782  
(%i66) f(x):=8-x^4+2*x^2;  
(%o66)  $f(x):=8-x^4+2x^2$ 
```

This plot command rotates the same function around the x axis. The volume is then computed.

```
(%i67) plot3d([x,scale*f(x)*cos(theta),scale*f(x)*sin(theta)],  
             [x,-2,2],[theta,0,2*pi],  
             [plot_format,geomview],[run_viewer,false])$  
       system("mv ~/maxout.geomview img-01-22b.gv")$  
(%i104) system("geomview img-01-22b.gv &")$
```



```
(%i105) integrate(%pi*f(x)^2,x,-2,2);  
(%o105)  $\frac{75776 \pi}{315}$   
(%i106) float(%);  
(%o106) 755.7375394235561  
(%i107)
```