

Homework for Sections 10.6–10.7

Mathematics 114, Section 2

due Monday, October 14

Read Sections 10.6–10.7 of the textbook. Read pp. 117–128 of the Maple Lab Manual, on plotting surfaces, as well as the worked examples on pp. 219–220.

1. **Section 10.6:** 1–12, 17, 32, 49, 56, 61
2. **Section 10.7:** 1–10, 16, 21, 24, 34, 40, 44, 52 (use Maple to solve as well as to graph)
3. Consider the curve $y = x^2 + 1$ in the xy -plane. Find equations (in rectangular coordinates) for the surfaces obtained by revolving this curve
 - (a) around the y -axis
 - (b) around the x -axis

Use Maple to plot these two surfaces and check that they agree with your intuition.

What do we obtain if we revolve the curve around the z -axis?

4. Experiment with cylindrical coordinate formulas until you find one that generates something like the ‘Liberty Bell’ surface below. (Try to get both a smooth top and the vertical tangent line.)

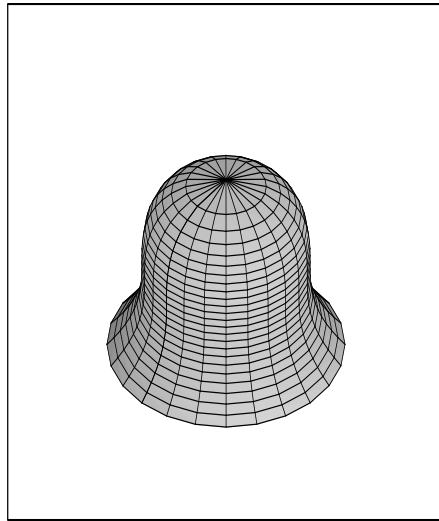
You can use formulas of the form $r = f(z)$ and the “cylinderplot” command in Maple to make this easier:

```
with(plots):  
cylinderplot(f(z), theta=0..2*Pi, z=a..b);
```

Alternatively you can use formulas of the form $z = f(r)$ and the Maple command “plot3d”:

```
plot3d([r*cos(theta), r*sin(theta), f(r)], theta=0..2*Pi, r=a..b);
```

Submit your formula and your plot.



Make sure you can do the core problems.

(10.6 — 1–12,45,52,57,74; 10.7 — 1–10,17,27,32,39,40,43,51).