Math 242 Lab 3
Areas and Volumes of Revolution

Li-An Chen
Department of Mathematical Sciences, University of Delaware
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Lab Assignment

- Complete ALL Lab Assignment Questions (with codes, computation results, and brief answer question in page 6)
- Submit “lastnameLab03.nb”
  and “lastnameLab03.pdf” **(File->Save As → pdf)** on Canvas
- Deadline: **Tomorrow 11:59pm**
- Correct computation results (without codes) are available on Canvas → Files → Lab → Lab_03_Lab_03_Areas and Volumes of Revolution → lab03_examples_hints

NSolve & Solve

- **NSolve[f[x]==g[x],x,Reals]**

  will solve x in f(x)=g(x), and output the real number solutions in numerical values.

- **Solve[f[x]==g[x],x,Reals]**

  also works, but it’ll give exact formula.

Plot

- Only one curve: Plot[f[x], {x,0,1}]
- Multiple curves on the same plot:
  Plot[{f[x],g[x],h[x],…..}, {x,0,1}]
- PlotLegends:
  Plot[{f[x], g[x]}, {x, -5, 5}, PlotLegends -> "Expressions"]

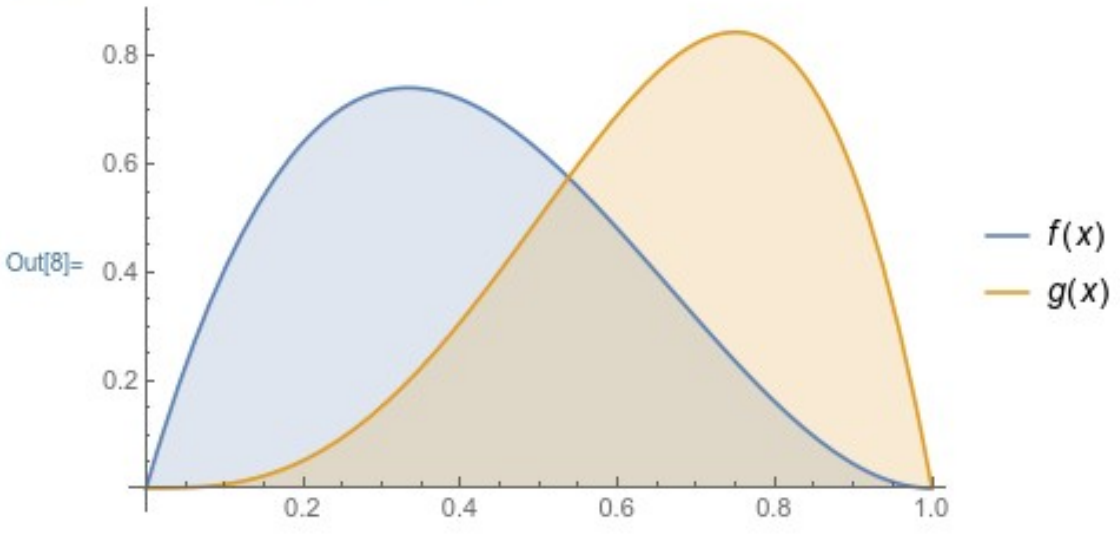
  or:
- Plot[{f[x], g[x]}, {x, -5, 5}, PlotLegends -> {“f[x]”,”g[x]”}]

Plot : “Filling” option

- Filling->Axis

```
In[8]:= Plot[{f[x], g[x]}, {x, 0, 1}, Filling → Axis, PlotLegends → "Expressions"]
```

Out[8]=

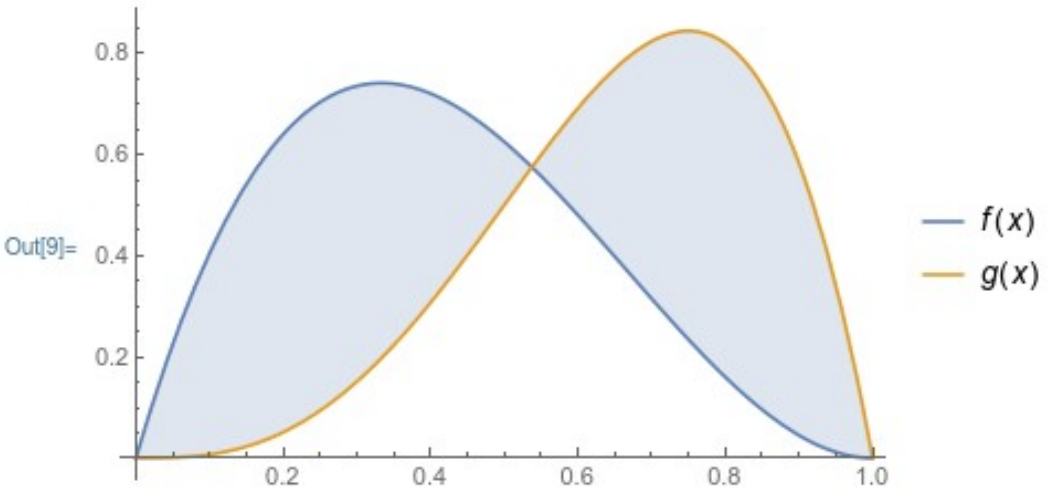


Plot : “Filling” option

- Filling->{1->{2}}

```
In[9]:= Plot[{f[x], g[x]}, {x, 0, 1}, Filling → {1 -> {2}}, PlotLegends → "Expressions"]
```

Out[9]=



Washer method and Shell Method

- Here we only integrate with respect to dx. So washer=horizontal axis, shell=vertical axis
- Washer: when rotate about y=h, g(x) is further than f(x) to the axis
- **Pi*Integrate[(h - g[x])^2 - (h - f[x])^2, {x, a, b}]**
- Shell: when rotate about x=h, g(x)>=f(x) on interval [a,b]
- **2*Pi*Integrate[Abs[h - x] (g[x] - f[x]), {x, a, b}]**

Wrong

- e^-x
- exp^-x
- Exp^[-x]
- e(-x)

Correct

- E^(-x)
- Exp[-x]
- Note: “E” is the number e=2.71828…, and “Exp[x]” is the function e^x.

Wrong

- ClearAll
- Clear
- clear[f]
- Clear(f)
- Clear f,x
- Clear f[x]
- Clear[f[x]]

Correct

- Clear[f]
- Clear[f,g]
- Clear[f,g,x]
- ClearAll[f]
- ClearAll[f,g]