

**FTC1 Problems**

These problems replace and supplement problems from Section 5.4 that deal with the First Fundamental Theorem of Calculus. A few of these are the same as problems in the text so you can check answers in the back of the text.

1. Finish making a plot of  $A(x)$  for the example from the in-class handout.
2. (5.4 #41) Find  $dy/dx$  for  $y = \int_0^x \sqrt{1+t^2} dt$ .
3. Find  $dy/dx$  for  $y = \int_3^x \sqrt{1+t^2} dt$ .
4. Find  $dy/dx$  for  $y = \int_{-2}^x \sqrt{1+t^2} dt$ .
5. Find  $dy/dx$  for  $y = \int_x^1 \sqrt{1+t^2} dt$ .
6. Find  $dy/dx$  for  $y = \int_0^{\sin x} \sqrt{1+t^2} dt$ .
7. (5.4 #47) Find  $dy/dx$  for  $y = \int_0^{e^{x^2}} \frac{1}{\sqrt{t}} dt$ .
8. Find  $g'(x)$  for  $g(x) = \int_2^x e^{-u^2} du$ .
9. Find  $g''(x)$  for  $g(x) = \int_2^x e^{-u^2} du$ .
10. Find  $f'(x)$  for  $f(x) = \int_{\cos x}^x e^{-u^2} du$ .
11. Do 5.4 #79.