

Do the following problems from [SHE]:

- Exercises 5.2: #5, 6, 21, 40.
- Exercises 5.3: #4, 6, 20, 22, 24, 33.

In addition, do the following problems:

A. For all $x > 0$, define

$$F(x) = \int_{\sqrt{x}}^{x^2+x} \frac{1}{2 + \sqrt{t}} dt.$$

Compute $F'(x)$.

B. At each point (x, y) of some curve, the slope is given by the function $g(x)$. The curve passes through the point (x_0, y_0) . Find an equation in the form $y = f(x)$ for the curve. [Hint: Try an example first: say, the slope of the curve at the point (x, y) is $2x$ and the curve goes through the point $(0, -3)$. What is the equation of the curve?]