

Math 111-002  
Assignment # 1

*The material in this assignment covers topics from Math 110.*

1. Find the equation of the tangent line to the curve  $y = x\sqrt{1+x^2}$  at the point  $(1, \sqrt{2})$ .
2. Let  $h(x) = \sqrt{f(x)/g(x)}$ . Find  $h'$  in terms of  $f, f', g, g'$ .
3. Find  $\int \sin x \cos(\cos x) dx$ .
4. Find  $\int_0^4 x\sqrt{16-3x} dx$ .
5. Calculate the area of the region enclosed by the two curves  $y = 1 + \sqrt{x}$ ,  $y = (3+x)/3$ .
6. Use the Midpoint Rule, with  $n = 4$ , to approximate

$$\int_0^1 (x^2 + 1) dx.$$

Find the actual value of the integral and compare with the value you obtained.