



Math 181  
Recitation Quiz 3 (2.1 – 2.4)

Full Name \_\_\_\_\_  
Full Name \_\_\_\_\_  
Full Name \_\_\_\_\_  
Date \_\_\_\_\_

Open notes, open book. No more than 3 per group.  
All questions worth 10 points. No work = No credit.

1. What is the definition of the derivative of a function  $y$  at  $x$  (use the format given in Definition 4 in section 2.1)?
2. Using the definition in question 1, find the **slope** of the tangent line to the curve at any point for the function  $f(x) = \frac{x-5}{x+2}$ .
3. Using the definition in question 1, find the **equation** of the tangent line to the curve at the point  $x = 0$  for the function  $f(x) = x^2 + 2x$ .
4. Find the derivative of the function  $f(x) = \sqrt{x}$  using the definition from question 1. State the domain of the function and the domain of the derivative.
5. Prove (using the definition in question 1) that the derivative of a constant is zero.
6. Prove (using the definition in question 1) that the derivative of a linear function is its' slope.
7. (20 pts) Differentiate  $f(x) = \sqrt{x}(x^2 - 1)$  by
  - a. Multiplying through and using the power rule
  - b. Using the product rule
  - c. Simplify to show they are equivalent.
8. (20 pts) Differentiate  $f(x) = \frac{x^2 - 4\sqrt[3]{x}}{x}$  by
  - a. Dividing through and using the power rule
  - b. Using the quotient rule
  - c. Simplify to show they are equivalent.