

## Applied Calculus – Quiz 8

1. Given  $x^5 + 2xy - y^3 = 2$ , use implicit differentiation to find  $\frac{dy}{dx}$ .
2. The volume of a cantaloupe is given by  $V = \frac{4}{3}\pi r^3$ . The radius is growing at the rate of 0.25 cm/week at a time when the radius is 2 cm. How fast is the volume changing at that moment?
3. Find the equation of the line tangent to the graph of  $f(x) = 2e^{-3x}$  at the point  $(0, 2)$ .
4. Differentiate each of the following functions without simplifying your answers.
  - (a)  $f(x) = x^4e^{3x}$
  - (b)  $g(x) = \sqrt{e^{2x-1}} + e^{(1-3x)^5}$