

18.022 Recitation Quiz  
6 October 2014

1. Let  $f(x, y) = \cos(3xy)$ , and suppose that  $x = 4st$  and  $y = \frac{1}{s} + \frac{1}{t}$ . Find  $\partial f/\partial s$  and  $\partial f/\partial t$  (by whatever method you prefer).

2. A cylindrical tree grows in such a way that its height increases at a rate of 1 meter per year and its diameter increases at a rate of  $\frac{1}{10}$  meters per year. At what rate is the volume of the tree increasing when its height reaches 10 meters, assuming that its diameter is 1 meter at that time? Express your answer in terms of  $\pi$  and in units of cubic meters per year.