

## Math 32 A: HW8 Due Friday, December 3, 2008

- **Homework Details**

1. Only use the front side of the paper.
2. Write your name, ID number and section number on the back of the last page.
3. Homework will be graded on a 10 point scale. Three problems (chosen by the instructor) will be graded for 2 points each, and 4 points will be given for completeness of your work.
4. HW due at the end of class. No credit for late HW, no exceptions.

### Assigned Problems

- **Section 15.6**

Problems 20-25,28,29,39-41,52

- **Section 15.7**

Problems 5-10 (no need to use graphing software for these),39-45

- **Extra Credit:** If  $\mathbf{G}(s) = (x(s), y(s), z(s))$  is a parameterization of a curve in space where  $s$  is the arclength of the curve and  $f(x, y, z)$  is a given function. Show that the composite function  $w(s) = f(\mathbf{G}(s)) = f(x(s), y(s), z(s))$  satisfies

$$\frac{dw}{ds}(s) = D_{\mathbf{T}}f(x(s), y(s), z(s))$$

where  $\mathbf{T}$  is the unit tangent to the curve at  $s$ . Here,  $D_{\mathbf{T}}f(x, y, z)$  is the directional derivative of  $f$  at  $(x, y, z)$  in the direction  $\mathbf{T}$ . Show that this will not in general be true if the parameterization of the curve is not with respect to arclength.