

**MATH V1201 PROBLEM SET 4**  
**DUE OCTOBER 13, 2009.**

INSTRUCTOR: ROBERT LIPSHITZ

- (1) In the textbook:  
(§13.1) 19–24, 36, 42  
(§13.2) 4, 17, 24, 38  
(§13.4) 7, 19, 22, 23, 28, 33
- (2) List ten parametric curves you encountered in your life this week. At least one of them should be a *non-physical* example.

(Here's an example of a non-physical space curve: the curve  $\langle S(t), D(t), B(t) \rangle$  where  $S(t)$  is the value of the S& P 500 stock index at time  $t$ ,  $D(t)$  is the value of the Dow Jones Industrial Average at time  $t$ , and  $B(t)$  is the price of a ten year treasury bond at time  $t$ . But try to find something connected to your life.)

If you had trouble with	Do problems
13.1.19–24	13.1.29–32
13.1.36	13.1.37–40
13.1.42	13.1.41. Also: do the two paths intersect?
13.2.4	13.2.3–8
13.2.17	13.2.18–20
13.2.24	13.2.23–26
13.2.38	13.2.33–37
13.4.7	13.4.3–8
13.4.19	Find minimum speed in 13.4.10
13.4.22	
13.4.23	13.4.24–27
13.4.28	13.4.25, 13.4.26, 13.4.30
13.4.33	13.4.34–36

*E-mail address:* r12327@columbia.edu