Math 223

Week 2 Homework due Thursday, September 9

Sections 10.9, 11.1, 11.2

Section 10.9, problems 5, 8, 11, 15, 22, 23, 24

Hints:

15. Speed is $\frac{ds}{dt} = |r'(t)|$ at time t. Look at the rate of change of this expression. Note that $\frac{d^2s}{dt^2} = a_T = \frac{r'(t)\cdot r''(t)}{|r'(t)|}$.

Section 11.1, problems 1, 5, 19, 21, 25, 33, 35, 51

Section 11.2, problems 5, 13, 19, 23, 25, 29

Hints:

5. Consider approaching $(0, 0)$ along two lines with different slopes.

13. Use polar coordinates to express x and y in terms of r and θ ($x = r\cos\theta$, $y = r\sin\theta$), then note that $r \to 0^+$ as $(x, y) \to (0, 0)$. Now use L'Hopital's rule or rearrange algebraically to find the limit as $r \to 0^+$.