

Math 181

Friday, April 30

Problem Session

House keeping

Final Exam

Wed May 12

Two hours of material

(~ 7 pages)

Comprehensive (sequences/series)

12 - 3 PM / Th 395

Office hours by appointment

Mon - Internet Outage Day

Tue - Exam 4

Chapters 8, 9, 11

WW 11.2.5

$c(t) = (t^3 - 3t, t^2 + 1)$, $t \geq 0$ minimum speed?

$x(t) = t^3 - 3t$

$y(t) = t^2 + 1$

$\frac{ds}{dt} = \sqrt{x'(t)^2 + y'(t)^2}$
speed

$s(t) = \frac{ds}{dt} = \sqrt{(3t^2 - 3)^2 + (2t)^2} = \sqrt{9t^4 - 18t^2 + 9 + 4t^2}$

$= \sqrt{9t^4 - 14t^2 + 9}$ ← minimize this
checking critical points

Minimize s^2

$s^2 = 9t^4 - 14t^2 + 9$

$\frac{d(s^2)}{dt} = 36t^3 - 28t = t(36t^2 - 28)$

$36t^2 - 28 = 0$

$t^2 = 28/36 = 7/9$

$s(0) = \sqrt{9} = 3$

$s(\sqrt{7/9}) = \sqrt{32/9} \approx 1.88$

Critical points: $t=0$

~~$t = -\sqrt{7/9}, \sqrt{7/9}$~~