

Attaway 4th ed., Chap 14, problem 40

Computer Name: ITS-EBU2-239-20
Lab Name: EBU2-239

ucsd.edu
problem

LAST PROBLEM - TRAJECTORY - FUNCTIONS TO USE

(a) SYMBOLIC SOLUTION METHOD

syms - declare symbolic variables, e.g., syms x OR syms x y t

x = function of t, y = function of t

solve(y) - return t value(s) when function y = 0

double - convert symbolic value to double-precision floating point

subs(y,t,tend/2) or subs(y,tend/2) - get y value(s) when substitute into function a variable value(s)

max - get maximum value of double precision values

diff - not necessary but use, if you wish, diff to get symbolic of, e.g., dy/dt, where y = function of t

(b) NUMERICAL METHOD

max - get maximum value

i = find(y >= 0) - returns indices of array y where input argument of find is satisfied

note that x(end) gives you last value of array x

optionally can use a while loop to step along path...

$x = v_0 \cos(\theta_0) t$
 $= \text{constant} * t$
 $y = v_0 \sin(\theta_0) t - \frac{1}{2} g t^2$

$x_{MAX} = \frac{1}{2} x_{END}$
SINCE X VELOCITY IS CONSTANT

$y_{END} = 0$
 x_{END} ← y < 0 HOLE