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% Demo_01: Use the analytical solution to bound problem

% clear;

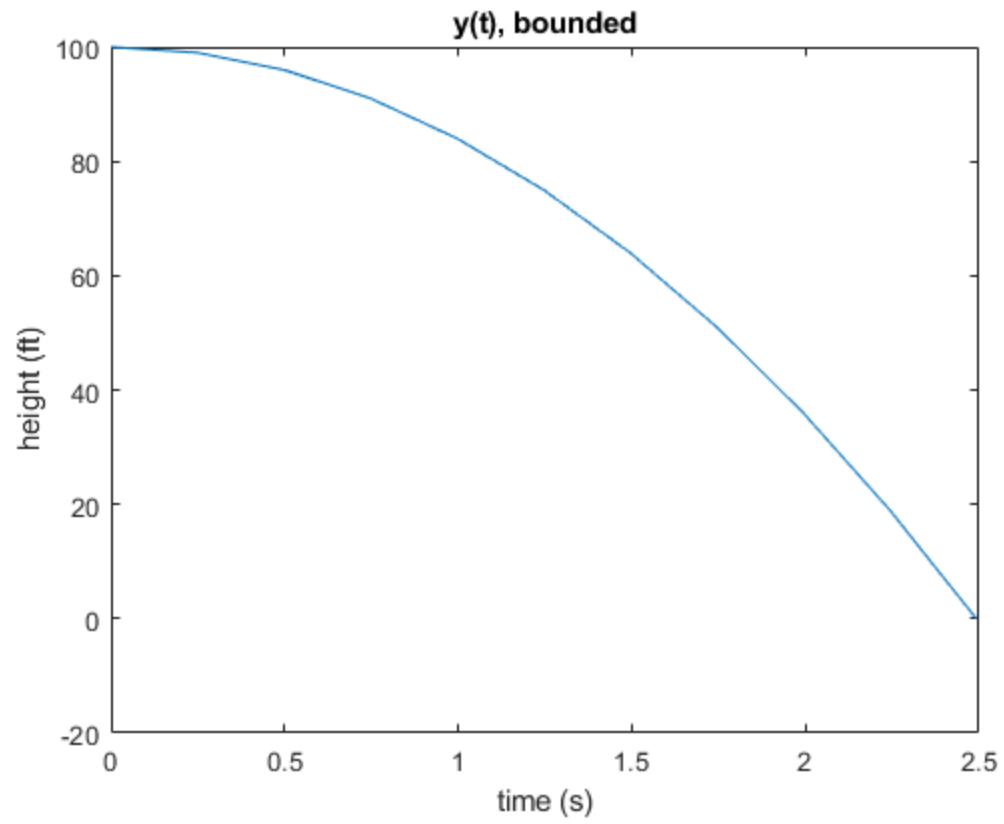
t_init = 0; % s
y_init = 100; % ft
y_final = 0; % ft
v_y_init = 0; % ft/s
a_y_init = -32.2; % ft/s^2
n = 11;

t_final_1 = (-v_y_init + sqrt((v_y_init.^2) - (4*(.5*a_y_init)*(-
(y_final-y_init)))))) / (2*(.5*a_y_init));
t_final_2 = (-v_y_init - sqrt((v_y_init.^2) - (4*(.5*a_y_init)*(-
(y_final-y_init)))))) / (2*(.5*a_y_init));

if (t_final_1 > 0 )
    t_final = t_final_1;
else
    t_final = t_final_2;
end

t_vector = linspace( t_init, t_final, n );
y_time = y_init + (v_y_init .* t_vector ) +
    (.5*a_y_init*(t_vector.^2));

plot( t_vector, y_time );
title('y(t), bounded');
xlabel('time (s)');
ylabel('height (ft)');
```



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