

Path of a Falling Object

A teenager throws a ball off a rooftop. Assume that the x coordinate of the ball is given by $x(t) = t$ meters and its y coordinate satisfies the following properties:

$$y''(t) = -9.8 \text{ meters/second}$$

$$y'(0) = 0$$

$$y(0) = 5 \text{ meters.}$$

- a) Find an equation directly describing y in terms of t .
- b) Find a parametrization $(x(t), y(t))$ which describes the path of the ball.
- c) Find the speed $\frac{ds}{dt}$ of the ball (this answer will only be valid for times before the ball hits the ground.)

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