Question #8548a ball is thrown vertically up. its height x, above ground level at time t is given by $x = 40t - 5t^2$ where x is in metres and time t is in seconds

a) what is the velocity of the ball at time t

b)what is the maximum height reached by the ball?

c)at what time does the ball reach the ground?

d)what estimate is being used for acceleration due to gravity in the original formula?

Solution. a) The velocity $v(t) = x'(t) = 40 - 10t$.

b) the maximum height is reached at time t^* such that $x'(t^*) = 0$, that is $t^* = 4$. Consequently $h_{\max} = x(t^*) = 160 - 80 = 80$.

c) the ball reaches the ground as $x = 0$, that is when $t = 8$(of course, $t = 0$ we do not take into consideration).

d) We estimated the acceleration g as $10 = 5c\dot{2}$.