

## Quiz 4

MATH 210, CALCULUS III, SUMMER 2015

NAME:

A soccer ball has an initial position of  $\langle 0, 0 \rangle$  and is kicked with an initial velocity of  $\langle 30, 6 \rangle m/s$ . Let the gravitational constant be  $10m/s$ .

**Problem 1.** Find the velocity and position vectors for the ball.

$$v(t) = \langle 30, 6 - 10t \rangle$$

$$r(t) = \langle 30t, 6t - 5t^2 \rangle$$

**Problem 2.** Find the flight time and range of the ball.

$$y(t) = 6t - 5t^2 = 0$$

$$t(6 - 5t) = 0$$

$$t = 0 \text{ or } \boxed{t = \frac{6}{5} \text{ seconds}}$$

↑ flight time

$$x\left(\frac{6}{5}\right) = 30\left(\frac{6}{5}\right) = \boxed{36 \text{ meters}}$$

↑ range.