



CHALLENGE PROBLEM FOR POINTS ADDED TO A
GRADE

Name _____

period _____

A quarterback throws the football to a stationary player 31.5 meters down the field.

1. If the football is thrown at an initial angle of 40° to the ground, at what initial speed must the quarterback throw the ball for it to reach the receiver?
2. What is the ball's highest point during the flight?

Solve this problem by finding the vertical and horizontal equations for motion

Use acceleration in the vertical & constant velocity in the horizontal

$$dy = V_{iy} * t + \frac{1}{2} g t^2$$

$$dx = V_x * t$$

remember $V_y = V \sin(40^\circ)$

$$V_x = V \cos(40^\circ)$$

& $\tan(\theta) = \sin(\theta)/\cos(\theta)$