

Quiz #3: Vectors and Motion in Two Dimensions

Problem 1 (2 points)

A girl kicks a soccer ball with an initial velocity of 15 m/s at an angle of 30° . Which one of the following statements is true?

- a) The horizontal component of the ball's initial velocity is 15 m/s.
- b) The vertical component of the ball's initial velocity is zero.
- c) The vertical component of the ball's velocity remains constant during the ball's flight.
- d) The horizontal component of the ball's velocity is zero at the ball's highest point.
- e) none of the above

Problem 2 (4 points)

Find the magnitude and direction of $\vec{A} - \vec{B}$. Vector \vec{A} has components $A_x = 5.0$ m and $A_y = -2.0$ m. Vector \vec{B} has components $B_x = -7.5$ m and $B_y = 4.0$ m.

Problem 3 (5 points)

A football is kicked upward from the ground with an initial velocity of 25.0 m/s at an angle of 35.0° above the horizontal. **(a)** How long a time does it take for the ball to reach its maximum height? **(b)** What is the ball's maximum height? **(c)** What is the ball's speed at its maximum height?