Honors Physics **Quiz 2: Kinematics** **Mr. Kelley**

$v = \frac{\Delta x}{t}$ $v_f = v_0 + at$ $v_f^2 = v_0^2 + 2a\Delta x$ $x_f = x_0 + v_0 t + \frac{1}{2}at^2$

1. A vector $\vec{a}$ points with an angle of 45° above the horizontal. If the x-component of $\vec{a}$ is 10 units, what is the y-component?

2. A football is kicked from the ground with an initial velocity of $\vec{v} = 20$ m/s, at 60° above the horizontal. With what velocity (magnitude and direction) will the ball hit the ground?

3. Consider the same football being kicked. The kicker notices that v_y of the ball is +10m/s when the ball first reaches eye-level. What is v_y of the ball when it reaches eye-level again?

4. Still the same ball; What is v_y when the ball is exactly half way through its flight?

Show all work on the following problems, which refer to the football in problem 2:

5. What is the max height of the football?

6. How long does it take the football to get to the max height?

7. What is the time that the football is in the air?

8. How far down the field does the football land?