Honors Physics **Test: 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 bicyclist is traveling at a speed of 14 mi/h. How many seconds does it take them to travel 50 ft? (Hint: 5280 ft = 1 mi)

2. How far does a rock fall under the influence of gravity in 3 s, if it starts from rest?

3. How far does a rock fall under the influence of gravity in 3 s, if it has an initial velocity of 5 m/s downwards?

4. Mr. Brazil is riding his motorcycle on a level road at 100 km/h. He horizontally launches off a cliff overlooking the ocean (don't worry, he's experienced). The water is 100 m below.

   (a) How long before the splash?

   (b) How far from the base of the cliff does he land?

5. Mr. Kelley is riding his motorcycle at 100 km/h. While changing tracks on his iPod, he doesn't notice the approaching curb (very dangerous, don't do this). Hitting the curb at full velocity, he launches at 20° above the horizontal.

   (a) What is the maximum height Mr. Kelley will clear?

   (b) How far from the curb does he land?

   (c) He survived, and wrote this test, and will give you two points for writing the name of any band or musical group you like in the space below.

6. Mr. Brazil is swimming back to shore after his motorcycle stunt. In still water he can swim 1.5 m/s. He is trying to swim directly east towards the beach, but there is a 1 m/s rip current pulling him south. He is 60 m away from the beach.

   (a) What does Mr. Brazil's velocity (magnitude and direction) look like from up on the cliff?

   (b) How long does it take him to get to the beach?

   (c) How far south does he end up from where he started?