

Essay Questions (10 points each). **Show your work**, partial-credit will be given. **Circle** your answer.

1) A student jumps 0.85 meters straight up, on level ground. (a) How long is the student in the air? (b) For how long is the student within 0.10 meters of the top of the jump? (c) What fraction of the time is the student in the top 0.10 meters of the jump?

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2) A diving platform or diving tower has three platforms at 10 m, 7.5 m, and 5.0 m. Some students are going to drop or throw straight down identical balls from each platform and they want the balls to reach the water with the same velocity. The ball from the highest platform will just be dropped with zero initial velocity. (a) What velocity do you need to throw the ball from the middle platform? (b) What velocity do you need to throw the ball from the bottom platform?

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3) A football is kicked at an angle of 60 degrees above the horizontal. To make the field goal it must reach a height of at least 3.048 m above the ground. What is the minimum speed the ball can be kick in order make a field goal?