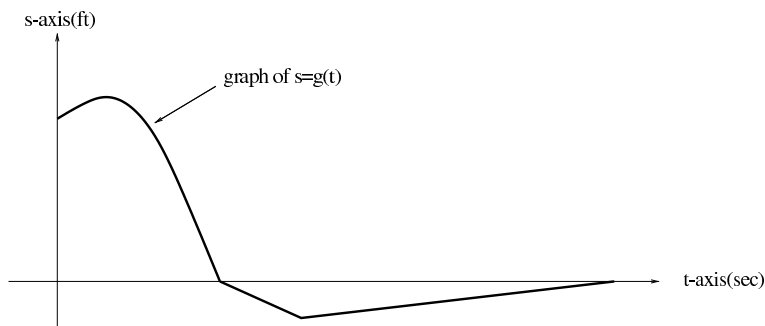

Instructions: You have 25 minutes for this quiz. You **MUST** show work for credit. If in doubt, ask for clarification.

1. (2 points) Start with the function $s = f(t) = t^2 - t + 1$ with t allowed to be any non-negative real number.

Calculate:

- (a) $f(0)=$
(b) $f(3t-1)=$
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2. (5 points) A swimmer jumps off a diving board into a pool. The function $s = g(t)$ keeps track of the height (in feet) of the divers head above water level at time t seconds. Here is the graph of $s = g(t)$.



- (a) Indicate the portion(s) of the graph where the function is increasing.
(b) Indicate the portion(s) of the graph where the function is decreasing.
(c) True or False: During the time domain for this graph, the diver spends more time above water than below water. (Make sure to give a reason.)

3. (13 points) Dave, Tiff, Allyson and John are practicing soccer. The picture describes everyone's location, assuming we impose coordinates with Tiff as the origin. Assume nobody moves. Dave kicks a ball directly toward Allyson and Tiff kicks a ball directly toward John.



- (a) (4 points) Find a linear model for the path of each kicked ball. Sketch each ball path in the picture.
- (b) (1 points) Are the two ball paths in (a) perpendicular?
- (c) (2 points) Where do the two ball paths in (a) cross (i.e. find the coordinates)?
- (d) (2 points) Assume Dave's kicked ball travels 50 ft/sec. When does the ball reach Allyson?
- (e) (4 points) Assume Dave's kicked ball travels 50 ft/sec. At time $t = 1$ second, where is the ball located (i.e. find the coordinates).