

Your Name

--

Your Signature

--

Student ID #

--	--	--	--	--	--	--

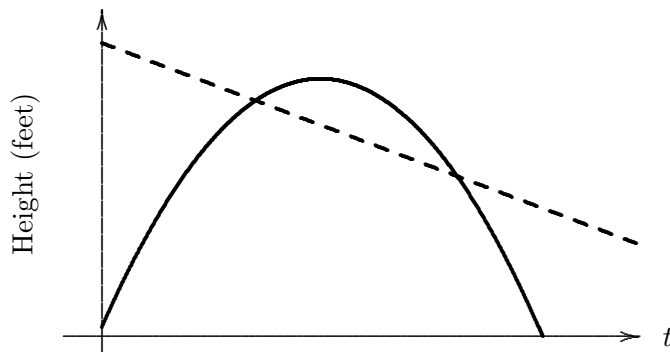
Quiz Section (circle one)

	Truman	Kelly	Hui
12:30	AB	AD	
1:30	AA	AC	AE

Problem	Total Points	Score
1	16	
2	12	
3	12	
4	10	
Total	50	

- You are allowed to use one sheet (8.5 by 11 inches) of handwritten notes for this exam. (You may write on both sides.) You are not allowed to share notes.
- You may use a scientific calculator, but not a graphing calculator. You may not use PDAs, such as Palm Pilots. You are not allowed to share calculators.
- In order to receive partial credit, you must show your work. Be wary of doing computations in your head. Instead, write out your computations on the exam paper.
- Your answers should either be *exact answers* (like $2\sqrt{2}$) or rounded to two digits after the decimal (like 2.82) in whatever units you're using. Be careful not to round intermediate calculations whenever possible, as you will lose points for errors due to incorrect rounding.
- Place **YOUR FINAL ANSWER** to each question in the box provided.
- If you need more room, use the backs of the pages and indicate to the grader that you have done so.
- Raise your hand if you have a question.
- Good luck!

- 1 (16 points) A parachutist is dropping in to SafeCo Field to deliver the game ball for opening day. On the graph below, the height of the parachutist at time t seconds is shown by the dashed line. Unfortunately, he has forgotten the game ball, so Ichiro throws him a ball (shown by the solid curve below).



- (a) (4 points) At time $t = 0$ seconds (in the coordinate system above), the parachutist is 153 feet above the field. He is dropping at a constant rate of 15 feet per second. Find a formula for the height of the parachutist at time t seconds.

Height:

- (b) (4 points) The baseball that Ichiro throws has height $h = -16t^2 + 91t + 5$ feet at time t seconds. Find the time t when this ball is highest.

$t =$

seconds.

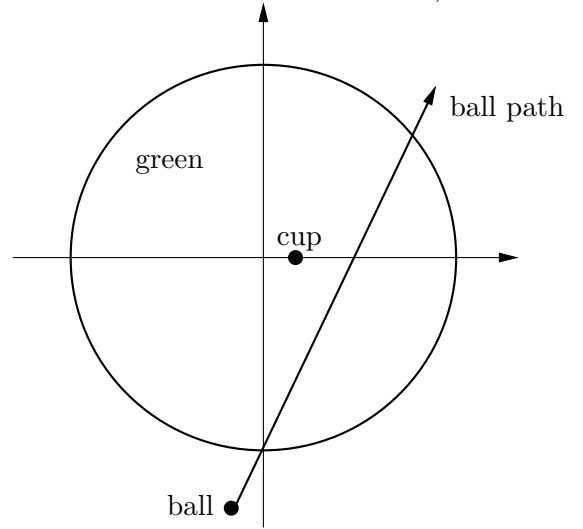
- (c) (4 points) Recall that the baseball that Ichiro throws has height $h = -16t^2 + 91t + 5$ feet at time t seconds. The parachutist catches the ball when he is at the same height as the ball *and the ball is on its way down*. Find the time t when the parachutist catches the ball.

$$t = \boxed{} \text{ seconds.}$$

- (d) (4 points) Find the greatest distance that the ball is *above* the parachutist. (This asks for a distance, not a time.)

$$\boxed{} \text{ feet.}$$

2 (12 points) You are again putting, now on the 10th hole. The green is a circle of radius 30 feet, and the cup is located 5 feet to the right of the center of the green. Your ball is located as pictured to the right (5 feet to the left of and 40 feet below the center of the green). The ball travels in a straight-line path; it enters the green through the lowest point.



(a) (4 points) Where does the ball exit the green?

At the point .

(b) (4 points) The ball travels at a constant rate of 10 feet per second. When does the ball exit the green?

seconds after it is struck.

(c) (4 points) Where is the ball located when it is closest to the cup?

At the point .

3 (12 points)

- (a) (5 points) Let $y = f(x) = x^2 + 1$. Simplify the expression $\frac{f(x+h) - f(x)}{h}$ so that there is no “ h ” in the denominator.

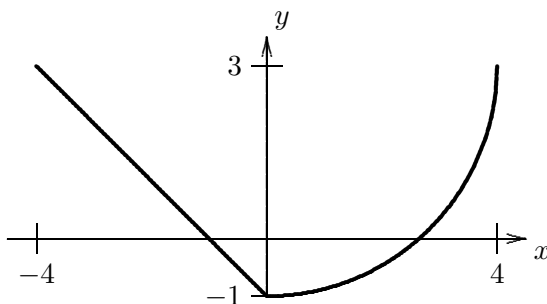
$$\frac{f(x+h) - f(x)}{h} =$$

- (b) (7 points) If $g(x) = \frac{x}{x+1}$ and $h(x) = \frac{1-x}{2x}$, find $g(h(x))$. What is the domain of this composition?

$$g(h(x)) =$$

Domain:

4 (10 points) Here is the graph of a function $y = f(x)$. It consists of a piece of a straight line and a quarter circle.



(a) (5 points) Give a (multi-part) formula for $y = f(x)$. Use the domain $-4 \leq x \leq 4$.

$f(x) =$

(b) (5 points) Graph the function $y = 3f(x + 1)$ on the axes below. Be sure to add units to your graph.

