Test 2 **MATH 220** Fall 2015

Name	$\operatorname{NetID}$

- Sit in your assigned seat (circled below).
- Circle your TA discussion section.
- Do not open this test booklet until I say START.
- Turn off all electronic devices and put away all items except a pen/pencil and an eraser.
- Remove hats and sunglasses.

▷ **AD1**, TR 11:00-12:50, Derek Jung

- You must show sufficient work to justify each answer.
- While the test is in progress, we will not answer questions concerning the test material.
- Do not leave early unless you are at the end of a row.

- Quit working and close this test booklet when I say STOP.
- Quickly turn in your test to me or a TA and show your Student ID.

	$\triangleright$	ΑI	<b>)2</b> ,	TI	R 9	:00-10	0.50,	Cla	ire N	/Ierr	imar	1				$\triangleright \mathbf{A}$	DK	, TF	10:	00 - 1	0.50, 1	Elizal	oetl	ı Fi	ield			
$\triangleright$ AD3, TR 1:00-2:50, Itziar Ochoa de Alaiza Gracia										$\triangleright A$	$\mathbf{DL}$	TR	11:0	00-11	1:50, E	Emily	Не	ath	L									
$\triangleright$ <b>ADA</b> , TR 8:00-8:50, Dara Zirlin										$\triangleright$ <b>ADM</b> , TR 12:00-12:50, Alyssa Loving																		
	$\triangleright$	ΑI	DВ	, T	R 9	9:00-9:	:50, ]	Dar	a Ziı	lin						$\triangleright A$	$\mathbf{DN}$	, TF	1:0	0-1:5	50, Aa	ron S	Schr	ebe	erge	$\exists \mathbf{r}$		
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▷ **ADJ**, TR 9:00-9:50, Elizabeth Field

1. (8 points) Find g'(t) given that  $g(t) = 80t^7 - 21t^4 + 18t - \arcsin(1/8)$ 

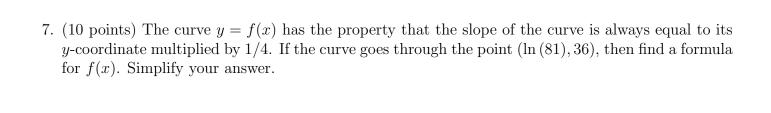
2. (8 points) Find  $\frac{dv}{dt}$  given that  $v=6t^4\arctan{(12t)}$ 

3. (8 points) Find f'(x) given that  $f(x) = \left(\frac{x^9 + 22}{\ln(x)}\right)^8$ 

4.	(8 points)	Find $h'$	(t) given	that $h(t)$	$) = \cos\left(e^{10t}\right)$	

5. (8 points) Find the slope of the line tangent to the curve  $x^4y^2 = 75x - 2y$  at the point (2,3).

6.	(10 points) A circle is increasing in size so that its circumference increases at the rate of 5 centimeter per minute. At what rate is the circle's area increasing when the diameter is 42 centimeters?	rs



8. (10 points) Determine the x-coordinate of the lowest point on the graph of the following function.

$$f(x) = 2\ln(64x^2 + 1) - 320\arctan(8x)$$

9. (10 points) Evaluate the following limit. Simplify your answer.

$$\lim_{x \to \infty} \frac{12 \sin(8/x)}{4e^{(1/x)} - 4}$$

10. (10 points) A function f(x) is continuous at each real number and it has the following first derivative.

$$f'(x) = 82 \left(\arctan(x) + 2\pi\right) \left(e^x + 42\right) \left(x^2 - 49\right) \left(x^2 + 144\right) \left(x - 10\right)^8$$

- (a) State each interval upon which the graph of f(x) is increasing.
- (b) State each interval upon which the graph of f(x) is decreasing.

- 11. (10 points) What is the largest possible area for a rectangle which satisfies all of the following conditions?
  - The rectangle's bottom left corner is at the origin.
  - The rectangle's top right corner lies on the curve  $y = \frac{182}{x^2 + 49}$  for x > 0.
  - The rectangle's bottom side lies on the x-axis.

## Students – do not write on this page!

1.	(8 points)
2.	(8 points)
3.	(8 points)
4.	(8 points)
5.	(8 points)
6.	(10 points)
7.	(10 points)
8.	(10 points)
9.	(10 points)
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Т	OTAL (100 points)