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## DIRECTIONS

- 1. Write your name, student ID number, recitation instructor's name and recitation time in the space provided above. Also write your name at the top of pages 2, 3 and 4.
- 2. The test has four (4) pages, including this one.

EXAM 2

- 3. Write your answers in the boxes provided.
- 4. You must show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit.
- 5. Credit for each problem is given in parentheses in the left hand margin.
- 6. No books, notes or calculators may be used on this exam.

(a) $y = e^{-5x} \operatorname{cc}$	os $3x$		 	 y. 
		ļ		
			•	
(b) $f(x) = \sin^2 x$	$^{-1}[(\ln x)^2]$	<u></u>	·	
			 	 •
			•	
(c) $y = \ln(\sec x)$	$x + \tan x$	<u> </u>		
		İ		
(d) $F(x) = \frac{\sin x}{1 - \sin x}$	2 x	<u> </u>	 	

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(10) 2. Find an equation of the tangent line to each curve at the given point.

(a)  $y = \sin(\sin x)$  at the point  $(\pi, 0)$ .

(b)  $y = \ln(\ln x)$  at the point (e, 0).

(9) 3. Find the exact value of each expression.

(a)  $\tan^{-1}(-\sqrt{3})$ 

(b)  $\sin^{-1}(\sin(\frac{4\pi}{3}))$ 

(c)  $\cos(\cos^{-1}(0.2))$ 

(4) 4. Find the differential dy of the function  $y = x \ln x$ .

dy =

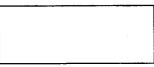
(6) 5. Find the second derivative of the function  $h(x) = \tan^{-1}(x^2)$ .

h''(x) =

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(6) 6. If  $\sin(y^2) = xy$ , find  $\frac{dy}{dx}$  using implicit differentiation.

(10) 7. Find an equation of the tangent line to the curve  $x^2y^2 = (y+1)^2(4-y^2)$  at the point (0,-2).



(12) 8. (a) Find the linear approximation of  $f(x) = \sec x$  at  $a = \frac{\pi}{4}$ .

 $\sec x \approx$ 

, for x near  $\frac{\pi}{2}$ 

(b) Estimate sec 47°.

 $\sec 47^{\circ} \approx$ 

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(12) 9. A ladder 10 ft long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a speed of 2 ft/sec, how fast is the angle between the top of the ladder and the wall changing when the angle is  $\pi/4$  rad?

(15) 10. A plane flying horizontally at an altitude of 3 mi passes directly over a radar station. The distance between the station and the plane is increasing at a rate of 600 mi/hr. Find the speed of the plane when the distance between the plane and the station is 5 mi.