

MATH 161 EXAM 2, Fall 2005

Simplify all answers. Show your work!		Name:	Score	
1.	Differentiate the function: a) $y = x\sqrt{x} + 2/x^2$      Ans:_____	b) $y = (x^2 + 1)^5$      Ans:_____	1	
			2	
			3	
			4	
			5	
			6	
			7	
2.	Differentiate the function: a) $f(t) = (t^2 - 1)(t^3 + 1)$      Ans:_____	b) $y = e^{2x}/x^3$      Ans:_____	8	
			9	
			10	
			Tot	
3.	Let $f(x) = (x + 2)^4(x - 1)^3$ . Find: a) The derivative $f'(x)$ .      Ans:_____	b) The values of $x$ for which the slope of the tangent is zero.      Ans:_____		
4.	The position of a particle is given by $s(t) = \sin 2t - 3 \cos 2t$ . Find: a) The velocity at $t = \pi/4$ .      Ans:_____	b) The acceleration at $t = \pi/4$ .      Ans:_____		
5.	Use analytic methods to find the limits: a) $\lim_{x \rightarrow 0} \frac{\cos 4x - 1}{3x}$ .      Ans:_____	b) $\lim_{x \rightarrow 0} \frac{3 \sin 4x}{5 \sin 2x}$ .      Ans:_____		
6.	Differentiate the function: a) $y = \cos^3(x^5)$ .      Ans:_____	b) $y = \ln \sqrt{x^2 + 1}$ .      Ans:_____		

7. Use implicit differentiation to find  $y'$ .  
 $\sin(xy^3) + y^2 + 3x = 7.$

Ans: \_\_\_\_\_.

8. Use logarithmic differentiation to find  $y'$ :  
 a)  $y = \frac{e^x(x-2)^2}{\sqrt{x+3}}.$

b)  $y = x^{\ln x}.$

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

9. Differentiate the function:  
 a)  $y = 4 \sin^{-1}(x^2).$

b)  $y = \sinh^{-1}(\sqrt{x}).$

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

- 10 Let  $y = f(x)$  be defined implicitly by the equation  $x^3 + y^3 = 2.$   
 a) Find  $dy.$

- b) Find the linearization of  $f(x)$  at  $(1, 1).$

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

Extra space