NAME: SOLUTIONS

QUIZ 8

Dawson College
Course Code: 201-NYA-05 S07
Date: Mar 26th 2010
Instructor: E. Richer

Question 1. *(5 marks)*
Find the derivative of $f(x) = e^{\sin(2x)} \arccos(2x^2)$

$f'(x) = e^{\sin 2x}(\cos 2x)2\arccos(2x^2) + e^{\sin 2x}\left(\frac{-1}{\sqrt{1-(2x^2)^2}}\,4x\right)$

$= \boxed{2e^{\sin 2x}\left((\cos 2x)(\arccos(2x^2)) - \frac{2x}{\sqrt{1-4x^4}}\right)}$

Question 2. *(5 marks)*
Find the derivative (y') given the equation $x^2\cos y + \sin y = xy$

$2x\cos Y - (\sin Y)Y'x^2 + (\cos Y)Y' = Y + xY'$

$Y'(-x^2\sin Y + \cos Y - x) = Y - 2x\cos Y$

$\boxed{Y' = \frac{Y - 2x\cos Y}{-x^2\sin Y + \cos Y - x}}$

Question 3. *(5 marks)*
Find the derivative (y') given the equation $y = (3x+1)^{\arctan x}$

$\ln Y = \ln\left((3x+1)^{\arctan x}\right)$ TAKE ln both sides

$\ln Y = \arctan x \ln(3x+1)$ USE ln properties

$\frac{1}{Y}Y' = \left(\frac{1}{1+x^2}\right)\ln(3x+1) + \frac{1}{3x+1}(3)\arctan x$

$\boxed{Y' = (3x+1)^{\arctan x}\left[\frac{\ln(3x+1)}{1+x^2} + \frac{3\arctan x}{3x+1}\right]}$

NAME: SOLUTIONS

QUIZ 8b

Dawson College
Course Code: 201-NYA-05 S07
Date: Mar 26th 2010
Instructor: E. Richer

Question 1. *(5 marks)*
Find the derivative of $f(x) = e^{\cos(5x)} \arctan(5x^2)$

$f'(x) = e^{\cos 5x}(-\sin 5x)(5)\arctan(5x^2) + \frac{1}{1+(5x^2)^2}(10x)e^{\cos 5x}$

$= 5e^{\cos 5x}\left[(-\sin 5x)(\arctan 5x^2) + \frac{5x}{1+25x^4}\right]$

Question 2. *(5 marks)*
Find the derivative (y') given the equation $x^2 \sin y + \cos y = xy^2$

$2x\sin Y + (\cos Y)Y'(x^2) - (\sin Y)Y' = Y^2 + 2YY'x$

$(x^2\cos Y)Y' - (\sin Y)Y' - 2xYY' = Y^2 - 2x\sin Y$

$Y'(x^2\cos Y - \sin Y - 2xY) = Y^2 - 2x\sin Y$

$Y' = \frac{Y^2 - 2x\sin Y}{x^2\cos Y - \sin Y - 2xY}$

Question 3. *(5 marks)*
Find the derivative (y') given the equation $y = (2x+1)^{\arcsin x}$

$\ln Y = \ln(2x+1)^{\arcsin x}$ TAKE LN OF BOTH SIDES

$\ln Y = \arcsin x \ln(2x+1)$ DERIVE

$\frac{1}{Y}Y' = \frac{1}{\sqrt{1-x^2}}\ln(2x+1) + \frac{1}{2x+1}(2)\arcsin x$

$Y' = Y\left(\frac{\ln(2x+1)}{\sqrt{1-x^2}} + \frac{2\arcsin x}{2x+1}\right)$

$Y' = (2x+1)^{\arcsin x}\left(\frac{\ln(2x+1)}{\sqrt{1-x^2}} + \frac{2\arcsin x}{2x+1}\right)$