NAME: SOLUTIONS

QUIZ 6

DAWSON COLLEGE

NYA-Electrotech Section 7 - Calculus 1

Instructor: E. Richer

Date: Mar 5th 2010

This quiz is marked out of **10 points**

Question 1. *(5 marks)*

Given the following equation, find y' by implicit diferentiation.

$2y^2 - x^2y^4 = 4x - 6y$

$$4yy' - (2xy^4 + x^2 4y^3y') = 4 - 6y'$$

$$4yy' + 6y' - 4x^2y^3y' = 4 + 2xy^4$$

$$y'(4y + 6 - 4x^2y^3) = 4 + 2xy^4$$

$$\boxed{y' = \frac{4 + 2xy^4}{4y + 6 - 4x^2y^3}}$$

Question 2. *(5 marks)*

Given the following equation, find y' by implicit diferentiation.

$e^{x+y} - \ln y = 3\cos(y^3)$

$$e^{x+y}(1+y') - \frac{1}{y}y' = -3\sin y^3 (3y^2y')$$

$$e^{x+y} + y'e^{x+y} = -9y^2y'(\sin y^3) + \frac{1}{y}y' \quad \text{MULTIPLY BY } y$$

$$ye^{x+y} + yy'e^{x+y} = -9y^3y'(\sin y^3) + y'$$

$$ye^{x+y} = -9y^3y'\sin y^3 + y' - yy'e^{x+y}$$

$$ye^{x+y} = y'(-9y^3\sin y^3 + 1 - ye^{x+y})$$

$$\boxed{y' = \frac{ye^{x+y}}{-9y^3\sin y^3 + 1 - ye^{x+y}}}$$

NAME: SOLUTIONS

QUIZ 6b

Dawson College
Course Code: 201-NYA-05 S07
Date: Mar 5th 2010
Instructor: E. Richer

Question 1. *(4 marks)*
Given the following equation, find y' by implicit diferentiation.

$5y^3 - x^4y^2 = 3x - 5y$

$$15y^2y' - (4x^3y^2 + 2yy'x^4) = 3 - 5y'$$
$$15y^2y' - 2x^4yy' + 5y' = 3 + 4x^3y^2$$
$$y'(15y^2 - 2x^4y + 5) = 3 + 4x^3y^2$$
$$\boxed{y' = \frac{3 + 4x^3y^2}{15y^2 - 2x^4y + 5}}$$

Question 2. *(6 marks)*
Given the following equation, find y' by implicit diferentiation.

$e^{2x+y} - \ln y = 2\sin(y^2)$

$$e^{2x+y}(2+y') - \frac{1}{y}y' = 2\cos y^2 (2yy') \quad \text{multiply by } y:$$
$$ye^{2x+y}(2+y') - y' = 2\cos y^2 (2y^2y')$$
$$2ye^{2x+y} + yy'e^{2x+y} - y' = 4y^2y'\cos y^2$$
$$yy'e^{2x+y} - y' - 4y^2y'\cos y^2 = -2ye^{2x+y}$$
$$y'(ye^{2x+y} - 1 - 4y^2\cos y^2) = -2ye^{2x+y}$$
$$\boxed{y' = \frac{-2ye^{2x+y}}{ye^{2x+y} - 1 - 4y^2\cos y^2}}$$