IB Calculus ( More more Practice of Implicit differentiation)

Name: _____ Period: Key

Differentiate each function

1. $x^3 - 5y^2 = xy$

$3x^2 - 10y \cdot y' = y + x \cdot y'$

$y'[x + 10y] = 3x^2 - y$

$y' = \dfrac{3x^2 - y}{x + 10y}$

2. $x^2 - xy + y^2 = 1$

$2x - y - xy' + 2yy' = 0$

$y'[2y - x] = y - 2x$

$y' = \dfrac{y - 2x}{2y - x}$

3. $\cos y - \sin x = \sin y - \cos x$

$-\sin y \cdot y' - \cos x = \cos y \cdot y' + \sin x$

$y'[\cos y + \sin y] = -\cos x - \sin x$

$y' = \dfrac{-\cos x - \sin x}{\cos y + \sin y}$

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

$2x - 4 = 2y' \Rightarrow y' = \dfrac{2x - 4}{2}$

$y' = x - 2$

5. $xe^y + y\sin x = \dfrac{\pi}{2\sqrt{2}}$

$e^y + x \cdot e^y \cdot y' + y' \sin x + y \cos x = 0$

$y'[x \cdot e^y + \sin x] = -y\cos x - e^y$

$y' = \dfrac{-y\cos x - e^y}{x e^y + \sin x}$

6. $x^2 e^{2x^2+1} + 4y^2 = 1$

$2x \cdot e^{2x^2+1} + x^2(4x)e^{2x^2+1} + 8yy' = 0$

$y' = \dfrac{-2x e^{2x^2+1} - 4x^3 e^{2x^2+1}}{8y}$

$y' = \dfrac{-x e^{2x^2+1} - 2x^3 e^{2x^2+1}}{4y}$

7. $\sin x + 1 = \cos y$

$\cos x = -\sin y \cdot y'$

$y' = \dfrac{\cos x}{-\sin y}$

8. $x^2 - 4x = 2y \ln x - 2$

$\left(2x - 4 = 2\ln x \cdot y' + \dfrac{2y}{x}\right) \cdot x$

$2x^2 - 4x = 2x \cdot \ln x \cdot y' + 2y$

$y' = \dfrac{x^2 - 2x - y}{x \ln x}$