Math 143
Fall, 2006
Quiz 15 - §9.1

Name: **Solutions**

Complete the following problems by solving the following differential equations. Show all work to receive full credit.

1. $\dfrac{dy}{dx} = \sqrt{y}\ \cos^2\sqrt{y}$

$$\begin{aligned}
\frac{dy}{dx} &= \sqrt{y}\ \cos^2\sqrt{y} \\
\frac{1}{\sqrt{y}}\frac{1}{\cos^2\sqrt{y}}\ dy &= dx \\
\frac{1}{\sqrt{y}}\sec^2\sqrt{y}\ dy &= dx \\
\int \frac{1}{\sqrt{y}}\sec^2\sqrt{y}\ dy &= \int dx \\
2\tan\sqrt{y} &= x + C
\end{aligned}$$

2. $\dfrac{dy}{dx} = \dfrac{e^{2x-y}}{e^{x+y}}$

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$$\begin{aligned}
\frac{dy}{dx} &= \frac{e^{2x}e^{-y}}{e^x e^y} \\
\frac{dy}{dx} &= e^{2x}e^{-x}e^{-y}e^{-y} \\
\frac{dy}{dx} &= e^x e^{-2y} \\
e^{2y}\ dy &= e^x\ dx \\
\int e^{2y}\ dy &= \int e^x\ dx \\
\frac{1}{2}e^{2y} &= e^x + C
\end{aligned}$$