BONUS ASSIGNMENT
IMPLICIT DIFFERENTIATION
NYA-ELECTRO
SOLUTIONS

① $\dfrac{x^2+y}{\cos x} = 2x+y$

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

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

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

$$\boxed{y' = \frac{2\cos^2 x - 2x\cos x - \sin x(x^2+y)}{\cos x - \cos^2 x}}$$

② $e^{x/y} = \sin y + x$

$$e^{x/y}\left[\frac{y-xy'}{y^2}\right] = (\cos y)y' + 1$$

$$e^{x/y}[y-xy'] = y^2(\cos y)y' + y^2$$

$$ye^{x/y} - xe^{x/y}y' = y^2(\cos y)y' + y^2$$

$$ye^{x/y} - y^2 = y^2(\cos y)y' + xe^{x/y}y'$$

$$y' = \frac{ye^{x/y} - y^2}{y^2 \cos y + xe^{x/y}}$$