Solve $ydx = 2(x+y)dy$ using the substitution $y = ux$.

$$\begin{aligned}
uxdx &= 2(x+ux)(xdu+udx) \\
udx &= 2(u+1)xdu + 2(u+1)udx \\
(u-2u^2-2u)dx &= (2u+2)xdu \\
\frac{-2u^2-u}{2u+2}dx &= xdu \\
\frac{dx}{x} &= -2\left(\frac{u+1}{2u^2+u}\right)du
\end{aligned}$$

$$PartialFractions: \frac{1}{u} + \frac{-1}{2u+1} = \frac{u+1}{2u^2+u}$$

$$\begin{aligned}
-\ln|x| + c_1 &= 2\left(\frac{1}{u} + \frac{-1}{2u+1}\right)du \\
-\ln|x| + c_1 &= 2(\ln|u| - \frac{1}{2}\ln|2u+1|) \\
-\ln|x| + c_1 &= \ln\left|\frac{u^2}{2u+1}\right| \\
c_1 &= \ln\left|\frac{xu^2}{2u+1}\right| \\
c_1 &= \ln\left|\frac{(y^2/x)}{2(y/x)+1}\right| \\
c &= \frac{x^{-1}y^2}{2x^{-1}y+1} \\
c &= \frac{y^2}{2y+x}
\end{aligned}$$