

M242 Q4(c) (S. Zhang) . Name: _____

1. Find

$$\int_0^1 ye^{2y} dy$$

• **ans:** The idea is to make u' “simpler than” u while v' and v are about the “same”.
So it is obviously that $u = y$.

$$\begin{aligned} u &= y, & dv &= e^{2y} dy \\ du &= dy, & v &= \frac{1}{2}e^{2y} \end{aligned}$$

$$\int u dv = uv - \int v du$$

$$\begin{aligned} \int ye^{2y} dy &= \frac{y}{2}e^{2y} - \frac{1}{2} \int e^{2y} dy \\ &= \frac{y}{2}e^{2y} - \frac{1}{4}e^{2y} + C \end{aligned}$$