

2-3

#16

$$y dx = (ye^y - 2x) dy$$

not linear in  $y$

is linear in  $x$

$$y \frac{dx}{dy} - (ye^y - 2x) = 0$$

$$y \frac{dx}{dy} + 2x = ye^y$$

$$\frac{dx}{dy} + \frac{2}{y} x = e^y \quad \text{"std Form"}$$

$$P(y) = \frac{2}{y} \quad n(y) = e^{\int \frac{2}{y} dy} = e^{2 \ln(y)} = e^2$$

$$n(y) = y^2$$

$$y^2 \frac{dx}{dy} + \frac{2}{y} y^2 x = y^2 e^y$$

$$y^2 \frac{dx}{dy} + 2y x = y^2 e^y$$

$$\frac{d}{dy} (y^2 x) = y^2 e^y$$

$$y^2 x = \int y^2 e^y dy + C$$

Int by parts twice  $y^2 x = (y^2 - 2y + 2) e^y + C$