$$\frac{dv}{dt} = \frac{v(v+5)}{t}$$

$$\frac{dv}{v(v+5)} = \frac{1}{t}dt$$

$$\frac{1}{v(v+5)} = \frac{A}{v} + \frac{B}{v+5}$$

$$\int \frac{1}{v(v+5)}dv = \int \frac{1}{t}dt + C$$

$$1 = A(v+5) + Bv$$

$$B = -\frac{1}{5}$$
$$A = \frac{1}{5}$$

$$\int \frac{1}{5v} - \frac{1}{5(v+5)}dv = \ln t + C$$

$$\frac{1}{5}\ln v - \frac{1}{5}\ln|v+5) = \ln t + C$$

$$\frac{v}{v+5}^{\frac{1}{5}} = e^c t$$

$$\frac{v}{v+5} = k t^5$$

$$v = kt^5 v + 5kt^5$$

$$v = \frac{5kt^5}{1-kt^5}$$

$$1 = \frac{5k}{1-k}$$

$$1-k = 5k$$
$$k = \frac{1}{6}$$

$$\therefore v = \frac{5/6 t^5}{1 - t^5/6}$$

$$xy' + x^2 y = x e^{-x^2/2}$$

$$y' + xy = e^{-x^2/2}$$

$$\sigma y' + \sigma y x = \sigma e^{-x^2/2}$$

$$\frac{d\{\sigma y\}}{dx} = \sigma y' + \sigma' y \qquad \therefore \sigma' - \sigma x = 0$$

$$\sigma = De^{-\int -x dx}$$

$$= e^{x^2/2}$$

$$\therefore \frac{d\{e^{x^2/2} y\}}{dx} = e^{x^2/2} e^{-x^2/2}$$

$$e^{x^2/2} y = \int 1 dx + C$$

$$y = \frac{x + C}{e^{x^2/2}}$$