

2.2

$$7) \frac{dx}{x} = 3t^2 dt$$

$$\ln x = t^3 + C$$

$$x = Ce^{t^3}$$

$$10) \frac{dx}{dt} = \frac{t}{x(e^t e^{2x})}$$

$$xe^{2x} dx = t e^{-t} dt$$

$$\frac{1}{4} e^{2x} (2x-1) = -e^{-t} (t+1) + C$$

$$16) (x + xy^2) dx = -e^{x^2} y dy$$

$$x(1+y^2) dx = -e^{x^2} y dy$$

$$-xe^{-x^2} dx = \frac{y}{1+y^2} dy$$

$$\frac{e^{-x^2}}{2} + C = \frac{1}{2} \ln(y^2+1)$$

$$25) \frac{dy}{1+y} = x^2 dx$$

$$\ln(1+y) = \frac{x^3}{3} + C$$

$$1+y = Ce^{x^{3/3}}$$

$$y = Ce^{x^{3/3}} - 1$$

$$y(0) = C - 1 = 3, \text{ so } C = 4$$

$$y = 4e^{x^{3/3}} - 1$$