

(30) $y' - 2y + 4 = 0$ $y(1) = 4$

$$\frac{dy}{dx} = 2y - 4$$

$$\int \frac{dy}{2y-4} = \int dx$$

$$\frac{1}{2} \ln |2y-4| = x + C$$

$$\ln |2y-4| = 2x + C$$

$$2y - 4 = e^{2x+C}$$

$$2y = Ce^{2x} + 4$$

$$y = Ce^{2x} + 2$$

$$4 = Ce^{2(1)} + 2$$

$$2 = Ce^2$$

$$C = \frac{2}{e^2}$$

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

(33) $y' = (x-1)(y-2)$ $y(0) = 3$

$$\int \frac{dy}{y-2} = \int (x-1) dx$$

$$\ln|y-2| = \frac{1}{2}x^2 - x + C$$

$$e^{\ln|y-2|} = e^{\frac{x^2}{2} - x + C}$$

$$y-2 = ce^{\frac{x^2}{2} - x}$$

$$y = ce^{\frac{x^2}{2} - x} + 2$$

$$3 = ce^0 + 2$$

$$1 = c$$

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

$$\textcircled{35} \quad \frac{dy}{dt} = y e^{-t}$$

$$y(0) = 1$$

$$\int \frac{dy}{y} = \int e^{-t} dt$$

$$\ln |y| = -e^{-t} + C$$

$$e^{\ln |y|} = e^{-e^{-t} + C}$$

$$y = e^{-e^{-t} + C}$$

$$1 = e^{-1 + C}$$

$$C = 1 - \frac{1}{e}$$